JUNE 1941 Thirty-Five Cents Per Copy

Coal Age

Volume 46 Number 6

The meat of two great industry meetings forms the entire feature section of this issue of Coal Age. Up-to-date ideas on coal mining, preparation and utilization, as presented at the 18th Annual Coal-Mining Convention and Exposition of the American Mining Congress, are summarized beginning on p. 37. **The equipment exposition** is the subject of a special section, p. 55. . . . **Anthracite opportunities** was the theme of the Fourth Annual Anthracite Conference at Lehigh University, p. 71. Stokers and stoker-coal preparation shared the limelight with research in the field of new uses. . . . **Progressive** truck-mine operators yield to no one in modernizing for low cost and high product quality. Cases in point include White Bros. Coal Co., in the Hocking field of

(CONTINUED ON PAGE 7)

Contents

TESTED A McGRAW-HILL PUBLICATION READERSHIP

COAL AGE (with which is consolidated "The Colliery Engineer" and "Mines and Minerals") is published monthly on the 1st. Allow at least ten days for change of address. All communications about subscriptions should be addressed to the Director of Circulation, 330 West 42d Street, New York, N. Y.

Subscription rates: United States, Canada, Mexico, Central and South America, $3 for one year, $4 for two years, $5 for three years. Great Britain and British Possessions, 30 shillings for one year, 60 shillings for three years. All other countries, $5 for one year, $10 for three years. Single copies, 35 cents each. Entered as second-class matter Oct. 14, 1936, at the Post Office at Albany, N. Y., under the Act of March 3, 1879. Printed in the U. S. A. Cable Address: "McGraw-Hill, N. Y." Member A.B.P. Member A.B.C.

SYDNEY A. HALE, Editor
WALTER M. DAKE, Managing Editor
R. DAWSON HALL IVAN A. GIVEN J. H. EDWARDS
LOUIS C. McCARTHY CHARLES H. LAMBUR, JR. PAUL WOOTON
H. W. CLARKE, Vice-President

Contents Copyright 1941 by
McGRAW-HILL PUBLISHING COMPANY, INC.
JAMES H. McGRAW, Founder and Honorary Chairman
Publication Office, 99-129 North Broadway, Albany, N. Y.
Editorial and Executive Offices, 330 West 42d St., New York, N. Y.
JAMES H. McGRAW, JR. President — HOWARD EHRLICH Executive Vice-President — MASON BRITTON Vice-Chairman
B. R. PUTNAM Treasurer — D. C. McGRAW Secretary — J. E. BLACKBURN, JR. Director of Circulation
Branch Offices: 520 North Michigan Ave., Chicago; 68 Post St., San Francisco; Aldwych House, Aldwych, London, WC 2; Washington; Philadelphia; Cleveland; Detroit; St. Louis; Boston; Atlanta, Ga.

SORRY, MISTER,

I'm in a Hurry!

IT'S A BIG JOB, producing coal for busy plants rearming America. And every single piece of coal mining equipment must perform at peak.

In prominent mines in every coal-producing State, coal cutters, loaders, mine cars, tipples and other equipment are kept on the job, giving smooth, efficient performance when lubricated with TEXACO.

Prominent among Texaco Lubricants is *Texaco Olympian Mine Car Grease. Olympian Greases* reduce maintenance costs by staying in the wheel cavities and bearings, lasting longer, reducing application time.

The outstanding performance that has made Texaco preferred in each of the fields listed in the panel has made it preferred in prominent mines in every coal producing State.

These Texaco users enjoy benefits that can also be yours. A Texaco Lubrication Engineer will gladly cooperate. Phone the nearest of more than 2300 distributing plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York, N. Y.

Texaco Dealers invite you to enjoy FRED ALLEN in a full-hour program every Wednesday night. CBS, 9:00 E.D.T., 8:00 E.S.T.; 8:00 C.D.T., 7:00 C.S.T.; 9:00 M.S.T.; 8:00 P.S.T.

THEY PREFER TEXACO

★ More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.

★ More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.

★ More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.

★ More locomotives and cars in the U. S. are lubricated with Texaco than with any other brand.

★ More tourists use Texaco *Fire-Chief* Gasoline than any other brand.

★ More revenue airline miles within the U. S. are flown with Texaco than with any other brand.

TEXACO
REG T M

TEXACO Lubricants

FOR THE COAL MINING INDUSTRY

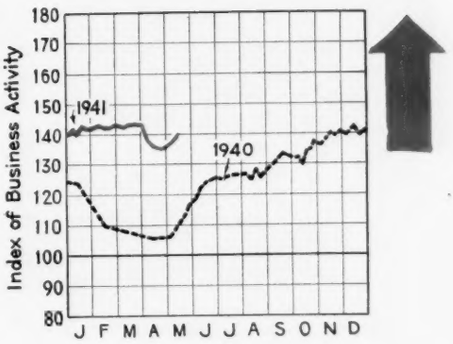
(CONTINUED FROM PAGE 5)

Ohio, which late in 1940 installed a new power plant, locomotive haulage and a complete new preparation plant. Details will appear in an early issue. . . . **Manpower** for mechanical mining now ranks with the major industry problems. What the problem is and how it can be met was the theme of the April Coal Age and a special session at the American Mining Congress meeting, p. 42. For good measure this issue shows you what many of the men on the firing line look like. . . . One loading machine served by one shuttle car equals 210 tons per shift with a 14-man crew underground at the Brophy mine in Montana. How it is done is slated for early publication . . . Summer is a time of growing corn and institute meetings. **Indiana proceedings** are chronicled on p. 90. Coming up are the June meetings of the Illinois Institute and the Mine Inspectors, with reports scheduled for the July issue. . . . **A stripping shovel** tailor-made to the job and designed to permit lengthening the stick in the future features the new Robin Hood No. 3 strip mine in Indiana. How this operation recovers 34 in. of coal under 35 ft. of cover with a 19-yd. stripper, a 5-yd. loader and 30-ton semi-trailers will be described in a forthcoming issue.

HOW'S BUSINESS

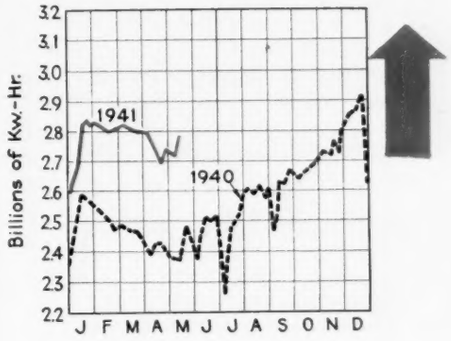
GENERAL BUSINESS CONDITIONS

The *Business Week* Index (May 17) advanced 3.3 points in a week, reaching 142.7, or 2 points under the high attained before the bituminous suspension. Car loadings—thanks to belated soft-coal shipments—rose 16½ per cent to surpass the peak of last year, and the comeback in steel was almost as spectacular. Apparently, business is all set for an advance into new high territory.



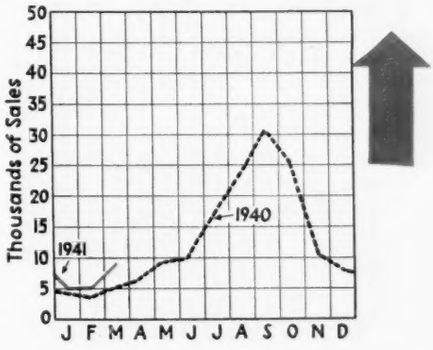
ELECTRICAL POWER OUTPUT

Output of electric energy by the electric light and power industry, according to the Edison Electric Institute, has advanced sharply in the last month over the corresponding period a year ago, especially during the week ended May 10. As defense efforts increase and more plants go on a three-shift day, the increase is expected to become more pronounced. Production figures for recent weeks are: April 19, 2,701,000,000 kw.-hr.; April 26, 2,750,000,000; May 3, 2,734,000,000; May 10, 2,791,609,000 kw.-hr.



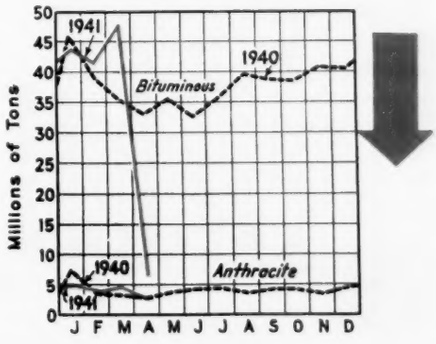
COAL STOKER SALES

Mechanical stoker sales in the United States in March last totaled 9,925 units (U. S. Bureau of the Census from 101 manufacturers), compared with 5,585 in the preceding month and 4,453 in March, 1940. Sales of small units in March last were: Class 1 (under 61 lb. of coal per hour), 9,218 (bituminous, 8,657; anthracite, 561); Class 2 (61-100 lb. per hour), 247 (bituminous, 234; anthracite, 13); Class 3 (101-300 lb. per hour), 245.



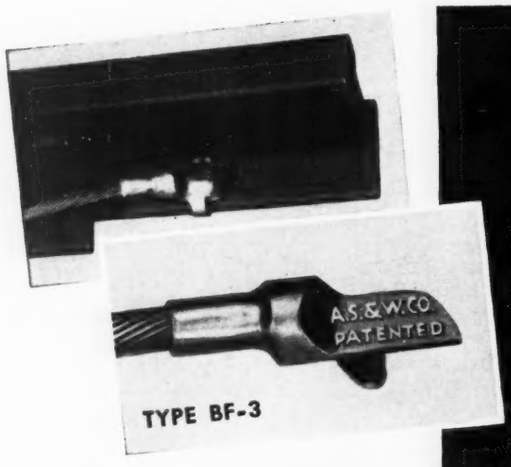
COAL PRODUCTION

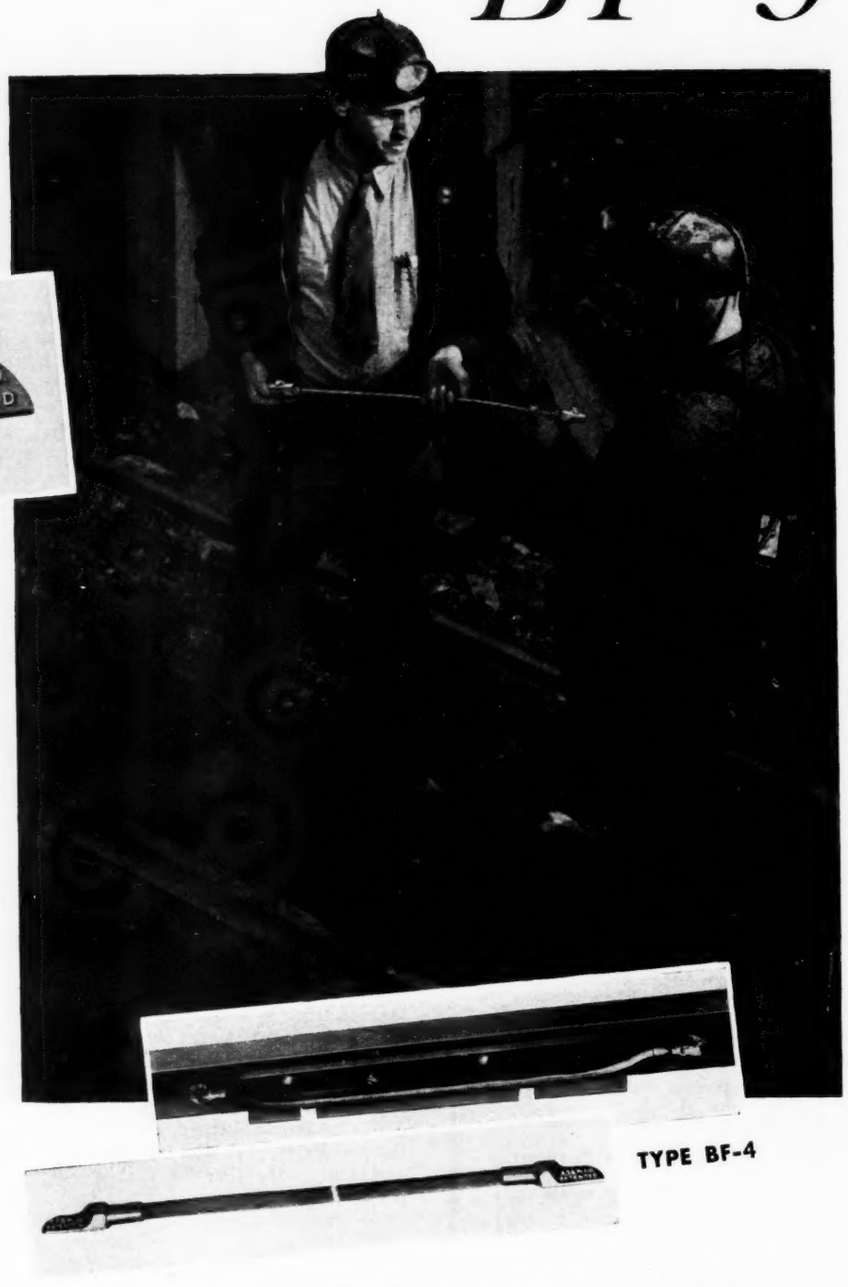
Bituminous coal produced by United States mines in April last (preliminary) totaled 6,266,000 net tons, according to the Bituminous Coal Division, U. S. Department of the Interior, which compares with 48,250,000 tons in the preceding month and 32,790,000 tons in April, 1940. Anthracite tonnage in April last, according to the U. S. Bureau of Mines, was 3,203,000 (preliminary), against 4,595,000 (revised) in the preceding month and 3,746,000 in April, 1940.



ADVERTISING PAGES REMOVED

MINERS AGREE ON THE *BF-3*





Here's a power bond that cuts welding time and gives long-lasting trouble-free service

THE TIGERWELD BF-3 was designed to simplify in every possible way the job of welding it to the rail—and at the same time provide an effective and lasting bond, good for long-time service.

This bond's terminal is formed into a sloping surface, at just the right angle for easy welding. No clamps are required to hold it in place. Just tap the terminal on the rail base with a hammer, and there it stays—held by self-clamping hooks on the terminals—until the weld is finished. If you aren't already using this bond, it will pay you to give it a try.

A modification of the Tigerweld BF-3 Power Bond, used where greater protection against mechanical damage is desired, is the TIGERWELD BF-4 Power Bond. The two are identical in every respect, except that the BF-4 has no self-clamping hooks on the terminals. It can therefore be pushed back against the rail web, and welded in place under the protecting shield of the rail head. In this position the terminal forms a pocket with the rail for depositing the welding metal. Both of these bonds are of typical Tigerweld construction, with solid steel terminals flash butt-welded to the conductors—made to give long, efficient service.

AMERICAN STEEL & WIRE COMPANY

Cleveland, Chicago and New York

For Anthracite Service: Miners Bank Building, Wilkes-Barre, Pa.

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* United States Steel Export Company, New York

UNITED STATES STEEL

DEVOTED TO THE OPERATING, TECHNICAL AND BUSINESS PROBLEMS OF THE COAL-MINING INDUSTRY

Coal Age

Established 1911 — McGraw-Hill Publishing Co., Inc.

SYDNEY A. HALE, Editor • JUNE 1941

Pertinent and Impertinent

• EMOTIONAL TIRADES enrich the language of vituperation and make good reading for an indifferent general public. But do they furnish a solid foundation for sensible adjustments and peaceful relations?

• U.M.W. wins a smashing victory in the new anthracite wage agreement. The only question still to be settled is who gets smashed. Consumers are increasingly cost-conscious these days and will not buy if they believe prices asked are too high. So, unless a substantial part of the wage advance can be absorbed through increased efficiency, both miners and operators may find themselves on the receiving end when the smashing really gets under way.

• COLLEGE is only one of the three stalwart legs of the tripod on which the student must erect and sustain his competency. His college course gives him training; he himself must contribute character and his employment must give him experience. Thus, when a man leaves college, he must himself provide executive ability and his employer must give him the opportunity to acquire an industrial background.

• CLASS I railroads, according to J. J. Pelley, president, Association of American Railroads, paid $12,549,000 more for bituminous coal last year than in 1939. But, as National Coal Association neatly points out, railroad purchases increased 6,598,085 tons, so that the actual cost was 3c. per ton less than in the preceding year. Which changes the picture—slightly.

• INTEREST in the effect of priorities on essential industries, such as coal mining, is growing. The American Mining Congress is suggesting a B-1 rating—the highest accorded for other than strictly military consumption—on mining equipment. Latest information from Washington indicates that some government agencies are becoming more aware of the dangers inherent in a system which withholds raw materials needed for the manufacture of mining machinery and parts. As one defense official puts it: "If mining stops, everything else stops." Set that down as the one gain from the April bituminous suspension. After all, wouldn't it be ironic if essential armament production were curtailed because the same priorities necessary to the continuance of that production shut down coal mines?

This Is Our War

APATHY is today's greatest handicap to speedy achievement of national-defense objectives. Too many Americans still look on the struggles across the oceans as something largely foreign to our future. They err. The world is engaged in an all-out war between two conflicting systems. If democracy abroad goes down in defeat, democracy in this hemisphere will be under direct totalitarian attack. Whether the attack be military or economic matters little: either would jeopardize, if not destroy, the American way of life. This is our war whether we actually fight in it or not. We cannot afford to enlist indifference as our ally.

Prices—and Profits

MINIMUM PRICES established under the Guffey act include no anlowance for profit. The element of a reasonable return becomes a factor only in the event the Bituminous Coal Division sets maximum prices. Then, says the law, "no maximum price shall be established for any mine which shall not yield a fair return on the fair value of the property." Minimum price fixing guarantees nothing; it merely designates the levels below which no producer operating under the code may sell.

With the law on the statute books since 1937, reiteration of these facts should be unnecessary. Evidence multiplies, however, that many both within and without the industry still have foggy notions of the profit aspects of the act. This fuzzi-

ness was manifest in some of the discussions during the recent wage negotiations. It crops up again in pronouncements from Washington on how much of the wage advances granted may be reflected in increased mine prices for bituminous coal.

These Washington press releases leave the impression that the reductions in costs effected since 1936 must be used as offsets against the 1941 wage boosts. That undoubtedly is true in so far as revisions of minimum prices by the Bituminous Coal Division are concerned. But, in the absence of maximum price fixing, the Guffey act interposes no bar to market prices sufficiently above present official minima to cover the wage increase in its entirety. The option clearly rests with the coal producer.

Exercising this option, however, is not as easy as it sounds. Despite rising demand for coal, competition generally has held actual market prices close to the minima made effective last October. Moreover, today the industry is subject to dual control. It must deal not only with the Bituminous Coal Division but also must bow to the mandates of the Office of Price Administration and Civilian Supply. If it wants reasonable profits, it must persuade that agency to forego "ceiling" schedules which deny the mines a fair return.

Sanity in Smoke

SMOKE ABATEMENT is a live issue —and will remain so. No man enjoys atmospheric pollution; those who campaign for its elimination appeal to a sympathetic audience. If the campaign is vigorous and continuous, action is sure to come. St. Louis proved that. Whether the action taken is economically sound or costs more than its worth socially may depend upon whether industry's attitude is one of opposition or of cooperation. Chicago is a great manufacturing center and yet little is heard there today of the smoke problem because for years the coal industry has worked in close cooperation with the city smoke-abatement authorities to foster a sensible reduction in air pollution.

A start has been made in the same direction in Pittsburgh, which recently threatened to become a center of agitation. At a meeting on the problem May 13, the smoke committee of the Western Pennsylvania Coal Operators' Association presented a report which is a model for sanity and fairness. That report approaches the problem in three steps. First should come the correction of the bigger sources of smoke, then an intermediate stage for further organization and development, and finally permanent legislation based on the experience gained while taking the first two steps.

The final objective, of course, is the maximum elimination of air pollution that is economically and socially justifiable. No blinking at facts, no soft-pedaling; just an honest effort to set the whole problem in its proper perspective.

Organization

THE 1941 Appalachian wage agreement is a major triumph for organization. Whether some of the specific terms of that triumph are wise or otherwise may well be the subject of debate. Appraisal in detail now, however, would be premature and will not be attempted. What defies argument is the fact that every demand which Mr. Lewis and his associates appear to have pressed with unyielding determination was granted by the operator members of the joint conference. Why?

Adherence to outworn traditions in the mechanics of wage negotiations did not help. But the basic answer was given at the conclusion of Mr. Lewis' initial presentation of the mine workers' demands. The operators, explained their spokesman, represented diverse interests and diverse groups; consultation among them would be necessary before a formal statement of their position could be made. And, in keeping with musty tradition, that reply included a pro forma denial of any wage advance when practically every operator was convinced some increase was inevitable.

Cold recital of these and other facts in connection with the New York negotiations does not make pleasant reading—particularly in view of the bitter emotions unloosed during the dreary weeks of conference. Nevertheless, a calm retrospective study of what has happened seems essential if the industry is to avoid a repetition of 1941 and establish future collective bargaining on a factual, instead of an emotional, horse-trading, basis. That desirable situation, however, can be achieved only through preparedness and organization.

Under present methods of negotiation, the operator members of the joint wage conference are always at a disadvantage in the collective-bargaining process. Organized labor makes its work a full-time job and is constantly gathering and developing data to support its position. The operator members are chosen a short time before negotiations begin; they have no single continuing organization back of them and, as soon as the contract is signed, return to their main job of producing and selling coal.

What is needed is a permanent fact-finding organization on the operators' side. Such an organization presupposes no displacement of active producers as members of negotiating committees. Its functions should be limited to continuous collection, analysis, and dissemination of economic facts which have, or may have, a bearing on industrial relations in the coal-mining industry. It should in no sense be either partisan or anti-labor in its work because one of its main objectives should be the establishment of such a reputation for impartiality that its findings will be accepted by men, management and the public.

Collective bargaining in the bituminous coal industry has a history which stretches back many, many years. Surely it has reached an adult stage where both parties to the process should be equally organized and prepared to discuss their problems on purely factual bases. Today only the union is so organized. This is a challenge to management. Will management let it go unanswered?

CINCINNATI CONVENTION

Brings Out 2,046 Operating Men

Eager to Gear Industry to National Defense

COAL'S contribution to national defense was the basic theme of the 18th Annual Coal Convention and Exposition of the American Mining Congress at Cincinnati, Ohio, April 28-May 2. First sounded in the keynote address at the opening session, practical application appeared and reappeared in papers telling how progressive companies were reducing costs and increasing efficiency. Further emphasis was given the theme in the exposition of new and old equipment designed to help the industry do a better job.

Although the widespread bituminous suspension in effect while the convention was going on kept many mining executives at home or in Washington, interest and enthusiasm at Cincinnati were undampened. Total operator registration for the week was 2,046. In 1940, operator registration totaled 2,782. Manufacturers and other exhibitors sent 1,760 men to the convention.

Vital to National Defense

Coal—to quote Secretary of Interior Ickes' 1940 report—said Dr. C. J. Potter, preparation manager, Rochester & Pittsburgh Coal Co., speaking for L. W. Householder, vice president, is vital to national defense. Its financial stability, economic security and uninterrupted operation are of paramount public importance.

Bituminous coal, contined Dr. Potter, is a basic material in steel and coke manufacture. To produce a ton of pig iron, 2,850 lb. of coal is used. By-product plants consume about 90,000,000 tons of bituminous coal annually. These plants produce 1,500,000,000 lb. of ammonium sulphate for explosives and fertilizer, over 130,000,000 gal. of benzol vital to the chemical industries, 25,000,000 gal. of toluol used in explosives, 400,000 gal. of phenol used in medicines, and a host of other by-products ranging from plastics—which are compensating in part for the shortage of aluminum and magnesium—down to aspirin and dyes.

Gavel Wielders

Moroni Heiner, president, Utah Fuel Co., Salt Lake City, took over as chairman of the first technical session of the 18th Annual Coal Convention and Exposition of the American Mining Congress at Cincinnati, April 28-May 2, after Julian D. Conover, secretary of the congress, formally opened the proceedings. Mr. Heiner also officiated as chairman of the Wednesday morning session. Chairmen of the other sessions were:

John T. Sydnor, vice president, West Virginia Coal & Coke Co., Omar, W. Va., Monday afternoon.

S. M. Cassidy, manager, Weirton Coal Co., Isabella, Pa., Tuesday morning.

W. J. Borries, general manager, Dawson Daylight Coal Co., Dawson Springs, Ky., Tuesday afternoon.

H. B. Husband, division manager, Consolidation Coal Co., Jenkins, Ky., Wednesday afternoon.

D. H. Pape, president, Sheridan-Wyoming Coal Co., Monarch, Wyo., Thursday morning.

L. E. Young, consulting engineer, Pittsburgh, Pa., Thursday afternoon.

Hugh B. Lee, vice president and general manager, Maumee Collieries Co., Terre Haute, Ind., Tuesday afternoon stripping session.

William L. Burt, vice president, Jefferson Co., Wheeling, W. Va., Wednesday afternoon stripping session.

The bituminous industry also furnishes 85 per cent of the energy consumed by the railroads, 49 per cent of that used by electric public utilities, and about 70 per cent of that consumed by manufacturing plants. Railroad and general industrial consumption are bound to increase because of defense demands. With Germany now controlling an annual production of 563,000,000 tons, the United States must be prepared to step up its output.

To meet defense needs, asserted Dr. Potter, the coal industry pledges the nation: (1) Increased production for any demand; (2) a better product which will enable industry to reduce the quantity for any given work and consequently lower transportation costs; (3) sale at only a small margin of profit; (4) greater production per man through mechanization, thereby releasing workers to industries needing greater man-power; (5) men trained as skilled mechanics and thus, without claim of exemption, made available for drafting into our armed mechanized forces.

St. Lawrence Project Scored

No single government project, declared B. D. Tallamy, chief engineer, Niagara Frontier Planning Board, is more pernicious and damaging to the mining industry and the whole nation than the St. Lawrence waterway and power project. In the main a canal with a 74-ft. channel, it is only incidentally a power development. All the proposed shipyards on the Great Lakes would be rendered valueless if the canal were destroyed, though small boats could leave, as now, by the Chicago Drainage, Oswego and Erie canals. The dam will have to be built on foundations excavated 80 to 100 ft.

Gilbert Smith, general manager, Fire Creek Coal & Coke Co., Fire Creek, W. Va.

J. E. Butler, president, Stearns Coal & Lumber Co., Ky.

W. F. Mandt, president, Stephens Elkhorn Fuel Corporation, Alphoretta, Ky., and J. W. Taylor, American Car & Foundry Co.

W. E. Widmer, president, Elmira Coal Co., Excelsior, Mo.; and J. R. Cartlidge and H. Schwartz, Cincinnati Mining Machinery Co.

John L. Driskell, top foreman, Princeton Mining Co., Ind.

Placide Mayeur, mine manager, Princeton Mining Co.

C. E. Lesher, president, Pittsburgh Coal Carbonization Co., Pittsburgh, Pa.

Ralph Morris, engineer; R. B. Hetherington, foreman, and Booker Shell, assistant mine manager, Blue Bird Coal Co., Harrisburg, Ill.

George Ploch, electrician, Princeton Mining Co.

R. M. Leseney, general master mechanic, Canton, Ill., and Walter B. Roe, geologist, Truax-Traer Coal Co., Chicago.

George Lane, electrician, Princeton Mining Co.

J. J. Forbes (right), supervising engineer, Safety Division, U. S. Bureau of Mines, Pittsburgh, Pa., with Syd Hale, of Coal Age.

below the water level in a river bigger in width and volume than the Niagara.

The work cannot be completed before the war is over. The power project will take five years; 100,000 men must be employed for seven years on the canal work. Even the Panama Canal is regarded as too vulnerable and the chairman of the House Naval Affairs Committee wants to eliminate the Panama locks. The St. Lawrence canal will have 17 locks in 67 miles. It will not help the farmer on wheat prices; it will expose the iron mines to foreign competition and jeopardize the movement of American coal to Canada, said Mr. Tallamy.

Quiz Program Popular

"Information—We Hope" had its first try-out at the Thursday morning session. This quiz program, under the direction of George B. Harrington, national program chairman and president of the Chicago, Wilmington & Franklin Coal Co., aroused such interest that the delegates asked that it be continued and expanded in the future. The program was based on questions submitted by various coal companies. Answers were given by a panel of experts assembled for that purpose on the convention platform.

"Should machine operators lubricate their own equipment or should this be done by a special crew?" was the first question. With triple shifting, answered Dr. L. E. Young, consulting engineer, experience has shown that the best results are obtained where lubrication is in charge of a special crew.

"Is more gas liberated per day in one room with two cuts per shift or in two rooms with only one cut each per shift?" was another question. More in the case of two rooms with single cuts, answered Raymond Mancha, Jeffrey Manufacturing Co., but the concentration hazard is greater in the room with two cuts. In the case of two or three cuts, added Harry Treadwell, general superintendent, Chicago, Wilmington & Franklin Coal Co., the gas does not have time to bleed off for 24 hours.

At Nellis, said C. W. Connor, general manager, Nellis Coal Corporation, answering the query how much additional degradation is caused by the extra dumping with shuttle cars, the increase has been 2 per cent. This, he explained, might differ at each individual mine, depending on the character of the coal.

"Should stoker coal be sprayed with a fine mist before spraying with a 500-viscosity oil?" The answer, said Mr. Treadwell, is one of inherent moisture. With Western coals, the viscosity has a definite effect upon results. With 7 to 8 per cent inherent moisture, Mr. Treadwell advocated using 600-viscosity oil; with 1 to 3 per cent moisture, 200-viscosity oil.

In order to guard against sabotage, what objection is there to placing mine fans underground was the final question. Absolutely none, replied Mr. Mancha, if there is a standby fan in operating condition on the surface. In fact, under such conditions, such placement is highly desirable even without considering sabotage possibilities.

Because of the bituminous suspension in April, during the next six months the transportation agencies of the nation will have to take on the extra burden of handling possibly 35,000,000 tons more of coal on top of a seasonally rising peak of traffic as a whole, declared Ralph Budd, transportation commissioner, Advisory Commission of the Council of National Defense. Barring interruptions reducing industrial requirements, he told a joint luncheon of directors and members of the Advisory Council of the Coal Division of the American Mining Congress, bituminous production will be upward of 500,000,000 tons this year. This is an increase of approximately 12 per cent over the 1940 output.

Transportation agencies and the coal mines both face the problem of securing deliveries on needed equipment and supplies as demands from the defense industries rise and priorities become more general. Departing from his prepared address, Mr. Budd suggested that it might be well to enlist the cooperation of the railroads as coal's biggest customer in pressing for proper consideration of the mining industry's requirements at Washington.

The importance of permitting a free flow of essential raw materials to manufacturers of mining equipment also was emphasized by Julian D. Conover, secretary, American Mining Congress, in opening the convention. Manufacturers, he said, already are reporting serious difficulties in obtaining certain key materials, such as alloy steels. The ability of the mines to meet any and all demands is dependent upon adequate personnel, transportation facilities and a continued supply of mining machinery and parts, and other essential equipment.

Better Mechanical Mining

ADVANCES in technique and practices, new methods and readaptation of older ones to modern conditions were emphasized in formal papers and discussions on mechanical-mining problems at the technical sessions of the 18th Annual Coal-Mining Convention and Exposition. The spotlight also was thrown on man-hours spent in auxiliary operations at mechanized mines. Interest in shuttle-car transportation and new developments in this field also continued high.

Loading equipment cannot be standardized effectively, asserted A. E. Duckwall, chief engineer, United States Coal & Coke Co., Gary, W. Va., because of variations in seam thickness, roof and floor conditions and depth of cover. Studies of man-hours involved in production in southern West Virginia and eastern Kentucky (see Table I) show an increasingly large percentage of time being devoted to operations incidental to loading. These auxiliary operations are: ventilation, timbering, slate handling, drainage, trackwork, cutting, drilling, shooting, gathering and moving. Moving takes 10 to 12 per cent of the time.

With mobile loaders discharging directly into mine cars, about 230 tons per 7-hour shift was obtained at the No. 43 mine of Peabody Coal Co., in Saline County, Illinois, said S. L. Anderson, superintendent, in a paper read by Frank White, of that company. Late in 1939, two 6-ton 42D Joy shuttle cars and one elevating conveyor to transfer coal from shuttle to mine cars were installed. Since then, production has run over 500 tons per shift and as high as 600 tons has been loaded. In development work, three Joy units load into mine cars (*Coal Age*, October, 1940, p. 88).

Roadways, continued the Anderson paper, should be kept clean, smooth and free of chuck holes because shuttle cars have no springs and depend on pneumatic tires to cushion the bumps at low places in the floor. When water is found, 3 x 4-in. stringers covered with 1½ x 12-in. planks are set over the wet places. With proper location of sumps and prompt pumping, however, much of this work can be obviated.

Two men change the batteries on the six shuttle cars now used and also grease all the equipment. A complete set of batteries for a shuttle car can be exchanged in 10 to 15 minutes. Batteries are charged at the shaft bottom, but changed near the

loading head where accessible to the track. One attendant can charge and service the 24 trays of batteries needed to operate twelve shuttle cars. It is better to charge at the shaft bottom because men can be specially trained for this work. Two maintenance men keep three two-car units in working order.

Last year six shuttle cars loaded 311,278 tons at No. 43 with only six lost-time accidents—51,879 tons per accident. During this period, five of the six units and their crews were being broken into service. Two accidents occurred while men were learning to drive the cars and were squeezed when the cars backed into the rib. A machine helper suffered a hernia and two other workers had fingers mashed when coal fell from the loading head. Accidents of this last mentioned type have been eliminated by flare boards. One man strained his back lifting drawslate.

Shuttle Cars End Delays

Shuttle cars put an end to most of the delays experienced with track units and increase tonnage by keeping the loading machine more fully utilized for loading. Peabody, added Mr. White, is now experimenting with a cable-reel shuttle car. Cable-reel shuttle cars are now in use at Consolidated Coal Co., remarked C. C. Conway, electrical engineer. An entry is being driven with three parallel headings into 6 ft. of No. 6 Illinois coal. The center heading is double-tracked with crossovers every 250 ft. or so.

The cable-reel car meets the needs of the mine of the Smokeless & Sootless Coal Co., Red Lodge, Mont., declared J. T. Brophy, president. The mine is small and batteries might be badly neglected. With grades up to 8 per cent, Mr. Brophy felt shuttle cars are better than rail cars. When the road gets covered with coal, explained Mr. White, the coal is shoveled behind the posts so that it will not be crushed. The maximum one-way haul is 600 ft. Drawslate up to 3-in. diameter is loaded out and removed at the preparation plant. Larger pieces are "jerried off" by the face men.

Track transfer cars are preferred at Princeton Mining Co., said D. W. Jones, general superintendent. This Indiana operation cannot accommodate large-capacity cars in its shaft and older workings. Transfer capacity should exceed haulage capacity 50 per cent. Three transfer cars should serve each loading unit. With larger cars, tonnage per transference is increased and less time is lost in spotting cars (see *Coal Age*, May, 1941, p. 47).

"Scooters" in West Virginia

Use of self-discharging rope-hauled drag boxes in low coal with both mechanical and hand loading at Pardee & Curtin Lumber Co., Webster Springs, W. Va., was described in a paper by the late A. Fred Phelps, superintendent. The paper was read by J. H. Edwards, associate editor, *Coal Age*, whose article on the same operation was published last month (pp. 52-57). Nonproductive time while the box was away from the face was mentioned by T. F. McCarthy, superintendent, Clearfield Bituminous Coal Corporation, in discussing Mr. Phelps' paper. Central Pennsylvania, he pointed out, has used scraper loading for more than twenty years. The closest approach there to the Pardee & Curtin system is the drop-bottom box at some operations. Rope-hauled drag boxes were tried out at a Darby seam mine in Virginia prior to 1920, remarked W. J. Borries, general manager, Dawson Daylight Coal Co.

Conveyor mining in seams from 22 in. to 10 ft. thick has cut mine costs 25 to 40 per cent at Alabama By-Products Corporation, said F. J. Immler, assistant to the chief engineer. In the Praco mine, where the seam is 4 to 10 ft. and has partings several feet thick, chain conveyors in rooms and shakers in headings and aircourses are used when one bench of the seam is taken. Except for main-slope headings, which are hand-driven because they need not advance rapidly, hand-loaded conveyors are employed exclusively at Colta mine in a seam averaging 33 in. Both shakers and hand-loaded chain conveyors are used in the Black Creek seam, averaging 22 in., with continuity interrupted by rolls and pinches, at the Bradford mine.

A large part of the total saving effected, Mr. Immler declared, is due to the better management and supervision necessary with that type of work. At present, he added, about 40 per cent of the Alabama output is conveyor-mined. This percentage, he predicted will increase, but the day will come when conveyors will be supplanted largely by "something better."

Completely mechanized in 1939, the Powhatan Point (Ohio) mine of Powhatan Mining Co., said S. W. Blakeslee, general manager, in a paper read by P. R. Paulick, mining engineer, averaged 5,680 tons per day from 37 working places in January. Five mobile loaders and 20 duckbills were used for the job. The coal is the No. 8 seam, 60 to 68 in. thick and topped with 5 in. to 7 ft. of typical Pittsburgh drawslate. A heavy limestone bed above which bends but does not break has blocked any successful pillar extraction.

Power Costs Cut

All rooms are worked triple shift with duckbills. Seven 4-in. x 18-ft. H-beams, weighing 7½ lb. per foot, are used at the face. Planks—90 per cent of which are recovered—are set between the beams as a safety measure pending permanent posting. Extensible steel roof jacks support beams and planks. Duckbill shakers discharge to a 1,200-ft. mother belt. Power cost has dropped from approximately 7.9c. per ton under hand loading to 5.8c. The mine is a shaft operation. Car capacity (water level) is 2.6 tons.

In 1938, under hand loading, stated Mr. Blakeslee, five cars of rock were hauled out for every 100 tons of coal; today the average is less than one car. Ninety days was required to drive up a room, if it could be kept open that long. With duckbills, a 300-ft. room is finished in five to six days. Duckbill moving is started as soon as a room is completed and the unit is again loading in 5 to 7 hours.

Excluding power, operating savings of 4 to 16c. per ton with belts instead of mine cars (see Table II) were reported by Carel Robinson, consulting engineer. In addition, he said, there are indirect savings which are difficult to evaluate.

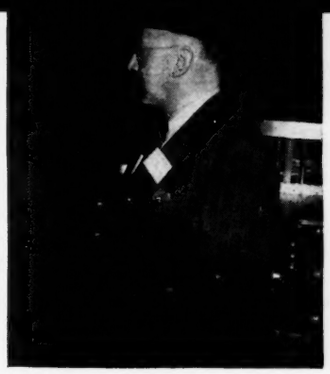
Table I—Percentage of Total Man-Hours Employed in Loading, Auxiliary Operations and Supervision

Method of working and conditions	Auxiliary Operations	Loading	Supervision
Hand loading, thick coal, medium cover, good conditions	41.03	57.55	1.42
Hand loading, thin coal, heavy cover, bad conditions	48.88	48.51	2.61
Conveyor loading with gathering and face conveyors, thin coal, heavy cover	51.04	43.79	5.17
Conveyor loading with face conveyors, thin coal, medium cover	54.07	40.73	5.20
Conveyor loading with duckbills, thick coal, medium cover	58.86	37.04	4.10
Mobile loaders, thick coal, light cover, bad conditions—Tipple *A*	80.40	14.36	5.24
Mobile loaders, thick coal, medium cover, good conditions—Tipple *B*	80.49	14.87	4.64
Mobile loaders, thick coal, medium cover, good conditions—Tipple *C*	83.49	12.68	3.83
Mobile loaders, thick coal, medium cover, good conditions—Tipple *D*	83.08	11.45	5.47

Table II—Belt vs. Mine-Car Transportation

	Actual Cost Belt Transportation Cents per ton	Estimated Cost Mine-Car Transportation Cents per ton
Operating labor cost	2.1	6.0
Four loading-point operators	..	3.0
Maintenance and replacement	0.9	1.0
Power cost (belt on a. c.)	1.4	2.5
Brushing top	3.1	6.0
Grading	..	0.5
Loss in face performance due to transportation delays	0.1	1.6
Accident cost	..	1.1
Decreased efficiency from transportation delays	..	2.0
Total	7.6	23.7

E. E. Ritter, president, Red Jacket Coal Corporation, Red Jacket, W. Va.

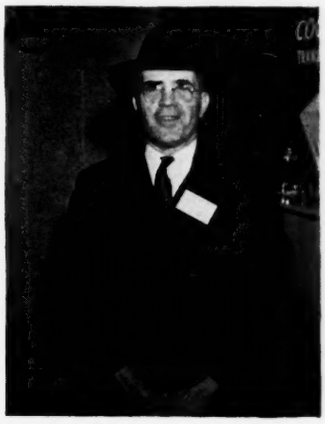


F. C. Menk, general engineer, Island Creek Coal Co., Holden, W. Va.

E. E. Ober, vice president and general superintendent; R. L. Rankin, Katherine Coal Mining Co., Lumberport, W. Va.; M. A. Kendall, chief engineer, and C. C. Moore, preparation engineer, Stephens-Adamson Mfg. Co.

Jack Lyons, safety engineer, Bell & Zoller Coal & Mining Co., Zeigler, Ill.

H. M. Shuler, vice president, Shuler Coal Co., Des Moines, Iowa.



John Maurice, engineer, Red Jacket Coal Corporation, Red Jacket, W. Va.

Gene Taylor, vice president in charge of operations, and Ellis Taylor, vice president in charge of sales, Ben-Hur Coal Co.

J. C. Crane, foreman, and William Robson, general superintendent, Adams, Rowe & Norman, Inc., Adamsville, Ala.

C. W. Connor, Jr., engineer, Inland Steel Co., Wheelwright, Ky.

James Meehan, Jr., superintendent; Joe Dias, mechanical engineer, Superior Smokeless Coal Co., Brush Valley, Pa.

G. Stuart Jenkins, assistant general manager, Consolidated Coal Co., St. Louis, Mo.

C. R. Bourland, division superintendent, Koppers Coal Co., Kimball, W. Va.

V. M. Barnard, superintendent, Carswell mine, Koppers Coal Co., Kimball, W. Va.

C. M. Goldinger and R. W. Whitaker, Anchor Coal Co., Cleveland, Ohio.

His figures were based on studies at mines with 100 per cent belt transportation from the working section to the tipple.

In a 36-in. seam, declared Mr. Robinson, 2c. per ton will cover all belt operating expense; in a 48-in. seam, it will be less than ½c. Replacement costs with extensible belts will be about the same whether the belt carries 100 or 300 t.p.h. One patrolman is needed for each 5,000 ft. or less of underground belting. Extending a belt 300 ft. requires six man-shifts. Generally the hours of use rather than the total tonnage handled determines the date when belting must be replaced.

Summarizing the advantages and disadvantages of belt transportation as he sees them, Mr. Robinson stated that the advantages were: (1) Delays need not exceed 5 minutes per day; (2) liability to personal injury is less; (3) there is less costly and more effective haulway timbering; (4) eliminating the transportation problem gives management more time for other problems; (5) suitability to difficult grade conditions; (6) a 30-in. belt can be used economically for any capacity between 100 and 300 t.p.h.; (7) power cost is less. On the unfavorable side are: (1) Expert care is required for setting up and maintenance; (2) the belt must be on straight lines, consequently there is difficulty in dodging around fault areas; (3) the investment may be higher than for track and car haulage.

What About Man-Power?

PERSONNEL problems as affected by the demands of modern mining and the shortage of trained men had an airing at the technical sessions of the Cincinnati convention. Vocational education in its broader aspects also was discussed. The idea of stimulating student interest and courses which would prepare high school boys for supervisory positions in coal mining was voiced by some of the speakers.

Mechanical mining creates many new non-mechanical problems in organization, personnel, skill and methods, declared James Hyslop, general manager, Hanna Coal Co. Compared with hand loading, mechanical mining has more than doubled the number of supervisors required and these men must be a superior type. On the engineering side, modern mining demands men trained in chemical, civil and mechanical engineering as well as in mining.

There must be careful, long-range planning. Men in supervisory and managerial positions, continued Mr. Hyslop, must have the imagination and initiative to develop new methods. Management must not only have a complete picture of its own particular mines but of the industry as a whole and its place in the economic and legislative set-up.

Each unit of 6 to 20 men in mechanical operations must have a separate supervisor. Experience has shown, asserted Mr. Hyslop, that attempting to put two or more units under a single supervisor does not work. Because there is a shortage of experienced men for supervisory positions, the industry must have a training program to develop men from its own ranks. Each foreman must be made to feel he is a definite part of management, executing the final phase of managerial responsibility. The workers, too, must be educated, and here the foreman has a real job to do promoting healthy labor relationships.

Machine operators, Mr. Hyslop found, furnish the best raw material for supervisors. Correspondence schools have done more than any other agency to fit men for such posts. The speaker hoped that high schools would play a greater part in this training in the future. Mechanical mining, he added, has greatly expanded the responsibilities of the superintendent. Multiple shifting increases the possibilities of friction between bosses. This is bad, but critical initiative should be encouraged.

The transition from hand loading to mechanical mining, stated R. E. Charier, personnel manager, Pittsburgh Coal Co., is still under way and industry must expect to have "growing pains." Success in hand loading depended largely on the legs of the foremen and superintendent; mechanical mining demands effective, organized personnel. Each man must know his responsibilities and have full authority to discharge them. There should be no bypassing of a supervisor except in emergency or where such bypassing is specifically provided for in the organizational set-up.

More attention, concluded Mr. Charier, must be given to the selection, placement and training both of workers and supervisors. There must be a well-defined line-and-staff organization with definite responsibilities and adequate authority for carrying them out.

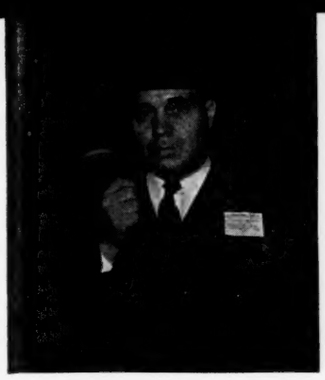
The supply of skilled workers easily may become the bottleneck in the defense program, said T. J. Thomas, president, Valier Coal Co., in a paper read by J. G. Crawford, general manager. Over 3,000,000 are now enrolled in vocational training courses in more than 300 cities in an effort to meet the demand. Nevertheless, the demand is so great that inroads may be made on the skilled personnel now employed in mining. The draft, too, may take its toll of these.

Heretofore, observed D. L. McElroy, dean, West Virginia University Mining School, the coal industry has been largely interested in trade-extension training; i. e., training on the job. If sufficient interest is developed in pre-employment training, however, many high schools in the mining regions can and will be glad to put on courses helping to prepare students for mining work. There is still a definite shortage of supervisors and maintenance personnel. Many operators needing help don't know what training should be given.

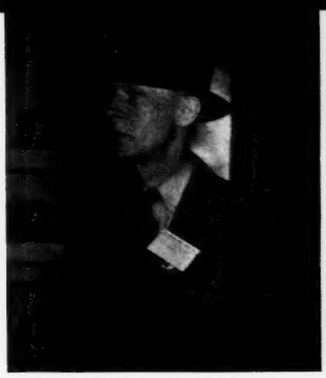
Saving Through Safety

HOW to make federal mine inspection work and accident prevention at mechanized operations were the outstanding phases of safety discussed at the Cincinnati convention. Prevention of mine-roof deterioration and the use of altimeter surveys in ventilation also received consideration. The safety aspects, too, were touched upon incidentally in reviewing power-distribution and maintenance questions (see p. 49).

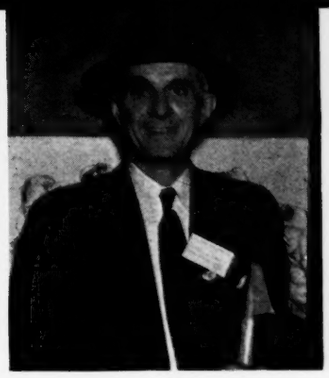
Many who cry loudly for federal intervention into safety inspection are seeking political advantage rather than preservation of life and limb, declared V. O. Murray, safety inspector, speaking for Eugene McAuliffe, president, Union Pacific Coal Co. Federal inspectors



James F. Bryson, director of safety, Harlan County Coal Operators' Association, Harlan, Ky.



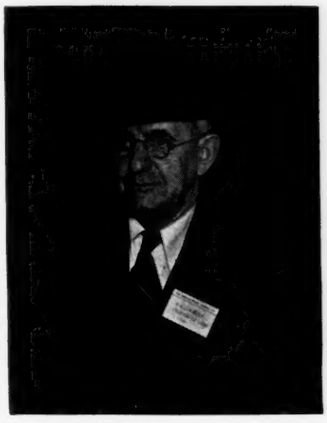
G. M. Patterson, chief inspector, Kentucky Department of Mines, Lexington, Ky.



E. E. Ritter, president, Red Jacket Coal Corporation, Red Jacket, W. Va.

C. W. Woolsey, general superintendent, Pyramid Coal Corporation, Pinckneyville, Ill.

James C. Puron, Stone Bridge Coal Co., Gallitzin, Pa.



W. N. Clagett, inspector, Pocahontas Land Corporation, Bluefield, W. W. Va.

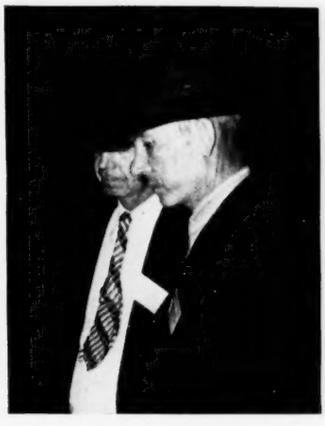
F. R. Toothman and John L. Schroder, graduate assistants at West Virginia University, and G. W. Allen, Valley Camp Coal Co., Morgantown, W. Va.

H. J. Sloman, associate professor of mining, University of Alabama.

W. J. Hines, superintendent, Stirrat No. 19 mine, and Edwin Jones, superintendent, Earling mine, West Virginia Coal & Coke Corporation.

A. D. Sisk, safety director, Big Sandy-Elkhorn Coal Operators' Association, Pikeville, Ky.

Earl R. Maize, F. A. Jones, Edward Thomas and A. L. Toenges, U. S. Bureau of Mines, Pittsburgh, Pa.



J. A. Thomas and John Friel, Straightsville Coal Co., New Straightsville, Ohio.

F. R. Buckley (center), assist. chief engineer, West Kentucky Coal Co., Sturgis, Ky.; L. B. Martin (left) and L. R. Crowell.

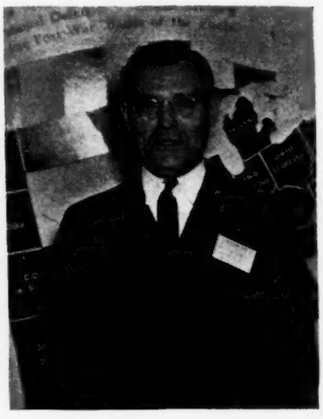
W. C. Fancourt, Bird Coal Co., Johnstown, Pa.; W. G. Black, Midland Sealtite Corp., Cleveland, and David E. Flowers, Differential Steel Car Co., Findlay, Ohio.

W. E. Witten, mining engineer, Wasson Coal Co., Harrisburg, Ill.

W. R. Young, president, Blocton Mining Co., West Blocton, Ala.

James Guiney, mechanical engineer, Princeton Mining Co., Princeton, Ind.

John A. Ryan, Jackson; Gerald Morton, Middleport; and D. J. Coneybeer, Carrollton; Ohio Department of Mines.

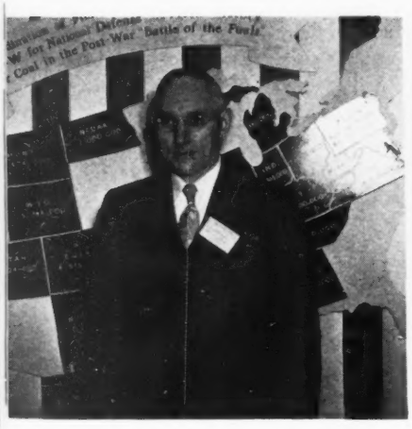


W. H. Tomlinson, U. S. Bureau of Mines, Vincennes, Ind.

John C. Cosgrove, consulting engineer, Johnstown, Pa.

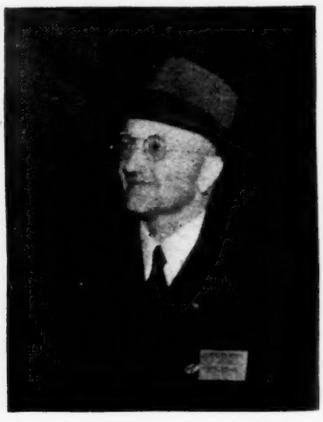
W. M. Currie, safety mgr., Leckie Collieries, Bluefield, W. Va.

Dr. I. W. Brandel, Ohio Carbon Co., and V. Smith, Smith Coal Co., Cleveland, Ohio.



Andrew Hyslop, Sr., ventilation engineer, Snow Hill Coal Corporation, Terre Haute.

E. J. Johnson, Jeffrey Mfg. Co., and Oscar Evans, electrical engineer, Republic Steel Corporation, Uniontown, Pa.



A. H. Shafer, supt., Powellton mine, Anchor Coal Co., Whitesville.

should have technical education and not less than ten years of practical experience. Half of this decade should have been spent in supervision. The coal industry, he added, welcomes regulations or inspections that will insure safety because accident prevention will more than return expenditures made for it.

Reductions in severity and frequency rates can be attained, insisted Mr. Murray. If they are not so obtained, he warned, more and more government control is inevitable. The men will go along with their employers if the latter will lead the way. Every normal human being hungers for service; if the company shows a disposition to help others, that interest will be stimulated in its employees.

Interest in Safety Grows

Mine workers are showing increasing interest in safety, added J. W. Woomer, general manager of mines, W. H. Warner & Co. A leadership in safety that is far more detailed, intimate and continuous than can be expected from any federal source always has been manifested by the State inspection service, and such an asset should not be thrown away. The law, remarked Dr. L. E. Young, consulting engineer, makes the operator responsible for safety. He must insist on the safe conduct of his operations by all employees and assure it by discharge and discipline. Uniformity in enforcement of law between large and small operators is a paramount need.

Now that we have federal inspection, said D. H. Pape, president, Sheridan-Wyoming Coal Co., let us try to get the utmost out of such inspectors by seeking their counsel in promoting safety. Too many operators, asserted J. F. Brophy, president, Smokeless & Sootless Coal Co. (Montana), vaunt their inalienable right to conduct their mines according to their personal ideas and wishes. Private arrangements with their own men under which they give rebates and bonuses create dissension in the mines of other operators. It would be better if policies were laid down by the producers' associations.

Such restriction, in the opinion of C. W. Gibbs, general manager, Duquesne Light Co., would eliminate progress. He had tried with some success to obtain written suggestions from miners as to improved safety practices. These suggestions had been rewarded with merchandise, as he did not believe in money prizes.

Only a wholehearted support all down the line can achieve the ultimate in safety accomplishments, according to R. H. Nichols, chief inspector, Pittsburgh Coal Co. In four years that company has increased the output per compensable accident from 14,000 to 70,000 tons. A large part of the cost of promoting safety is properly chargeable to production because greater safety brings increased efficiency.

Although mechanical mining introduces noise, is in many cases accompanied by larger open areas, and multiple shifting adds to the difficulties of proper maintenance and thorough rock-dusting, the ultimate result of mechanization, in the opinion of W. J. Fene, U. S. Bureau of Mines, should be an improvement in accident records. Mechanical mining naturally should lower haulage and explosive accidents. The change which puts the worker more fully under supervision puts a greater responsibility on the mine operator.

When pyrite in the mine roof changes to ferric sulphate, it swells with practically irresistible force, disintegrating the rock in which it occurs, asserted H. B. McNary, consulting engineer, New River Co. A like phenomenon probably attends hydrolysis of other hydratible rock components. Where cannel or bone free of pyrite protects the roof, no disintegration takes place. The effect of spraying an emulsified asphalt over the roof exposures is being tested. Other rock material, some caused to swell solely by moisture, may be partly responsible for roof deterioration.

Altimeter studies of mine ventilation, first applied in the United States in 1927, said Stephen Krickovic, general mine inspector, Koppers Coal Co., have progressed slowly because the immense cost and the savings possible in ventilation have been inadequately appreciated. For example, a mine in the Pittsburgh seam, producing 3,500 tons per shift and liberating 1,500,000 cu.ft. of methane every 24 hours, has in use air shafts, fan overcasts, stoppings and doors representing an expenditure of $250,000. The annual labor cost directly chargeable to upkeep and extension of the ventilation system is $10,000 and ventilation power cost is $12,000 to $18,000.

Two altimeters can be used concurrently underground or one can be read on the surface at certain predetermined times at 5- or 15-minute intervals and one below at the same time. This will correct for atmospheric fluctuations. Correction also is made for temperature. The altimeter is calibrated for a standard temperature at 50 deg. F., which makes it necessary to correct about 2 per cent for every 10 deg. above or below that temperature. Humidity is omitted from consideration, as its influence on weight of air is negligible.

Surveys should be made during working hours, for working-hour conditions are what management wants to know. Measurements, however, should not be made with open doors or standing or moving trips. Cages also affect air flow. As a result of such surveys, one gassy Pittsburgh mine producing 3,500 tons per shift increased its effective air volume 50 per cent with no change in motor horsepower input, but at an expense of $4,000 for building overcasts and permanent stoppings and converting certain headings from return to intake duty.

Weighing Cleaning Costs

THE ECONOMICS of preparation—with special reference to dewatering fines and sizing stoker grades—featured the coal-cleaning session of the Cincinnati convention. Coal over ¾-in. diameter, said Dr. C. J. Potter, preparation manager, Rochester & Pittsburgh Coal Co., in a paper read by E. H. Jenks, chief engineer, can be dewatered without difficulty. Air cleaning minus 14-mesh coal, however, is unsatisfactory; when water is used for these fines, the product is too wet and too much coal is lost.

How much should be spent on dewatering fine coal depends upon costs, methods used and upon the effect of complete, partial or incomplete dewatering on the quality of the product. Illustrating this conclusion, Dr. Potter set up the following comparisons between a Pennsylania low-volatile coal and an Illinois strip-mined coal:

	Pennsylvania	Illinois
Production cost....	$2.00	$1.30
Per cent of minus 0.5-mm. coal in mine-run	10.0	3.0
Selling price of ⅜x-0-in. washed coal	$1.90	$1.00

Wasting the minus 0.5-mm. coal would increase the Pennsylvania production costs to $2.22 and the Illinois mine cost to $1.34.

With a Pennsylvania and an Illinois mine each producing 500,000 tons yearly and the operating cost of dewatering the same in each case, the Pennsylvania mine could afford to make a much heavier investment in dewatering facilities. The maximum capital charges the Illinois mine could afford to assume for such facilities, said Dr. Potter, would be $74,000—and that would not permit a complete dewatering job. Because the loss in the Pennsylvania coal is so great, however, facilities could be purchased for about 50 per cent of its allowable maximum of $558,000, "permitting a substantial recovery of the additional cost."

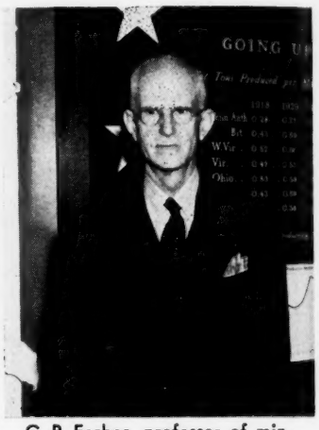
Coal, he continued, groups itself into four classes: Class I, in which ash regularly increases with decrease in size, as in Ohio, Illinois, Indiana and the high-volatile West Virginia fields. Class II, in which, except for minus 0.5-mm. coal, which usually is high in ash, the ash percentage shows little change as size

D. E. Vaughan, purchasing agent; Ted Bergrun, chief electrician; W. W. Youngblood, superintendent, Middle Grove mine, and Ralph Hays, superintendent, Atkinson mine, Midland Electric Coal Corporation, Farmington, Ill.

Dave Ward, chief engineer, and C. A. Hammill, president, Sycamore Coal Co., Cinderella, W. Va., and William A. Spears, advertising representative, Coal Age, Cleveland, Ohio.

Frank Strinlan (left), assistant division manager, Library, Pa.; and Joseph Krese (right) master mechanic, Westland mine, Pittsburgh Coal Co., Westland, Pa., greet the 1941 Maid of Cotton, Miss Alice Beasley, who visits Old King Coal.

K. R. Bixby, general manager, Midland Electric Coal Corporation, Farmington, Ill.



C. R. Forbes, professor of mining, Missouri School of Mines and Metallurgy, Rolla.

W. S. Gentry, engineer, and H. D. Bowker, preparation manager, West Virginia Coal & Coke Corporation, Omar.

John Gibson, chief engineer, Perfection Coal Co., Duquoin, Ill., and R. H. Morris, general manager, Gauley Mountain Coal Co., Ansted, W. Va.

M. K. Marlowe, president and general manager, Elkhorn & Jellico Coal Co., Whitesburg, Ky.

J. M. Knowles (left center); M. H. Forester (right center), division manager, Consolidation Coal Co., Fairmont, W. Va.; W. T. Ferguson (left end), A. C. Green (center) and D. M. Duncan (right end), Goodman Mfg. Co.

August J. Breitenstein, engineer, Pottsville, Pa., and Charles E. Brown, division engineer, Ashland, Pa., Philadelphia & Reading Coal & Iron Co.

Lea Marmet, secretary-treasurer Marmet Coal Co., Hernshaw, W. Va.

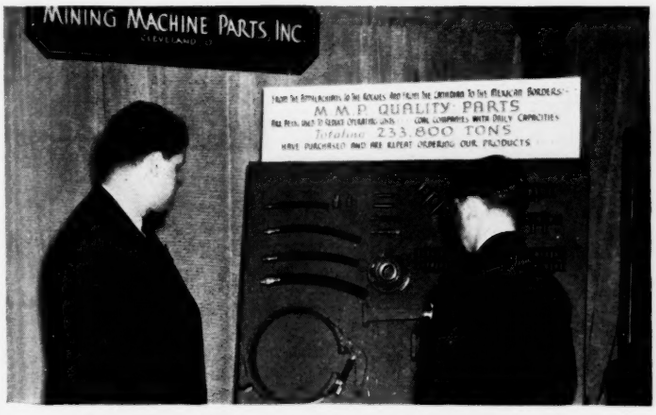
Charles Crowley, Continental Collieries, and R. L. Keenon, chief clerk, Bituminous Coal Producers' Board, Cincinnati, Ohio.

Mike O'Toole, Ohio Brass Co., and E. L. Thrower, Warner Collieries Co., Cleveland.

Wayne M. Davis (center), superintendent, Nellis mine, American Rolling Mill Co., W. Va.; N. B. Gurley (left) and J. B. Haskell (right), West Virginia Rail Co.

Dr. L. E. Young, consulting engineer, Pittsburgh, Pa.

E. R. Kaiser, Battelle Memorial Institute, Columbus, Ohio, and D. H. Pape, pres., Sheridan-Wyoming Coal Co.



Carl Ihli, graduate assistant, West Virginia University, and Paul Bigler, Mining Machine Parts, Inc.

Earl A. Riley (left) and Murrel Crump, Sinclair Coal Co., Kansas City, Mo.

Ralph G. Perry, chief engineer; George Eadie, superintendent, No. 6 mine; Sam Cape, superintendent, No. 5 mine; Walter Sadler, mine manager, No. 4 mine, and Horace Rawlins, electrical engineer, Sahara Coal Co., Harrisburg, Ill.

R. B. Hetherington, top foreman, Blue Bird Coal Co., Harrisburg, Ill., and J. E. Dunn, sales engineer, Allis-Chalmers Mfg. Co.

Table I—Relation of Ash Percentage to Size

Class	Percentage of Ash in 2-in. lump raw coal	¾-in.x½-mm. raw coal	½-mm.x0 raw coal	½-mm.x0 cleaned coal
Ia (Pa.)	5.0	9.0	20.0	9.0
Ib (Ill.)	8.0	10.9	25.0	18.0
II	7.0	7.0	8.0	5.0
III	12.0	7.0	9.0	4.0
IV	7.0	6.0	3.5	3.0

decreases. Class III, in which, again except for the minus 0.5-mm. coal, ash percentage falls with decrease in size, as in the medium volatiles of Pennsylvania and northern West Virginia. Class IV, in which ash percentage regularly decreases with decrease in size, as in the Appalachian low-volatile coals (see Table I).

It is doubtful, remarked Dr. Potter, whether it pays to use water in cleaning Class I*b*, II and III coals if the water must be removed from the minus 0.5-mm. coal. The trouble and expense involved do not justify wet cleaning Class IV coal. A cubic foot of ½-in. cubes has 20,736 sq.in. of surface and a cubic foot of ¼-in. cubes has 82,944 sq.in. of surface. If each piece of coal were a perfect cube, each size reduction of 50 per cent would give 100 per cent more surface on which water would cling.

Primary dewatering is effected by drainage conveyors, shakers or vibrating screens, centrifugals and thickeners or filters. Drainage conveyors, declared Dr. Potter, are the least effective, and screens pass too much fine coal. Secondary dryers may be hot-air devices with air delivered continuously or pulsatingly on the coal as it rests on the shaker or vibrator screens, or may be rotary, kiln-type or flash dryers. With flash dryers, fine coal is fed into a high-velocity stream of hot gases and the dried product is collected in a cyclone. The flash dryer, he asserted, is the only unit that successfully dries minus 0.5-mm. coal. Capacity is small, but, since the quantity to be treated also is small, the outlay involved is not excessive.

Trying to improve cleaning by installing more equipment often results in loss instead of profit, remarked T. W. Guy, consulting engineer. One cannot clean coal of its inherent impurity. Fine coal costs three times as much to clean as ⅜x4-in. coal, said C. P. Proctor, Pittsburgh Coal Co. Fusain in the fine coal helps prevent coke from developing cracks in the coking process; that is one reason for saving fine coal where coal is to be coked.

Stokers Make Big Gains

For every small domestic (Class I) stoker sold in 1930, stated Jack H. Price, coal sales manager, Stearns Coal & Lumber Co., there were 131 sold last year. Stoker-coal sales have increased from 3,000,000 tons in 1932 to 24,000,000 tons in 1940. There are 740,000 Class 1, 2, 3 and 4 stokers (using less than 1,201 lb. per hour) now in use; 680,000 of this total are in homes. The market, however, is still largely unscratched. It is estimated that there are 30,000,000 family units in the country and most of these units probably offer opportunities for stoker sales. Automatic heat is found in about 3,000,000 homes today, with 1,900,000 using oil, 500,000 gas, and 700,000 stoker coal.

Double-screened stoker coal free from fines, predicted the speaker, will be in strong demand for several years. He estimated this demand would increase at the rate of 1,500,000 to 2,000,000 tons annually. This would mean an additional 500,000 to 750,000 tons of resultant pulverizer slack for which he urged the stoker industry to develop efficient burning equipment. Stoker-coal pricing policies, he suggested, should be revised so that minimums would at least equal production costs.

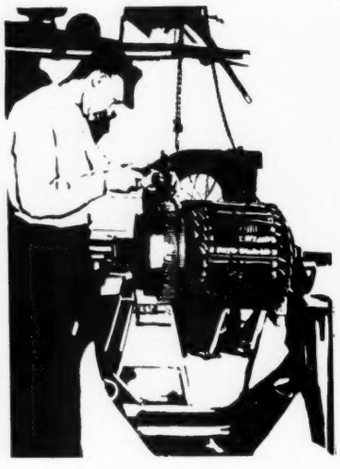
In 1930, oil burners outsold stokers 20 to 1; by 1940, the ratio had been cut to 2 to 1. Stokers are coal's best weapon in the battle of fuels. But the public, asserted J. S. Forman, vice-president, Mt. Olive & Staunton Coal Co., is asking for closer sizing than producers desire. The bottom size is not of great importance if a large proportion of through size near the required bottom size is tolerated.

As a result of stoker-coal demand, he continued, some larger coal has to be crushed most of the time. It is better to crush in two steps—6 in. to minus 2-in. and then in a crusher with shredded rings. This gives a larger yield of the required size. The Sheridan-Wyoming Coal Co., interjected D. H. Pape, president, also is crushing by steps, first to 2½ in. and then to 1 in. Sizing segregates according to type of coal—vitrain, clarain, durain and fusain—so the characteristics of size cover not only ash content and fusing temperature but also combustion and other characteristics, added Dr. M. M. Leighton, chief, Illinois State Geological Survey.

Power and Maintenance

HOW to maintain adequate voltage at the face was the major theme of the power-distribution discussions at the technical sessions of the Cincinnati convention. In the allied field of maintenance at underground operations, welding and lubrication had the first call on the attention of the delegates. Problems peculiar to maintenance at open pits were taken up during the special sessions devoted to strip mining (see p. 00).

"Good voltage" on a 250-volt distribution system was defined by R. L. Kingsland, electrical and maintenance engineer, Consolidation Coal Co., as the range between minus and plus 15 per cent. Substations should be less than one mile from face equipment. At least a 1,000,000-cir.mil feeder, in addition to the trolley wire, should extend from a 300-kw. 250-volt substation. Mr. Kingsland also advocated automatic reclosing circuit breakers to minimize the time of interruptions. From the safety standpoint, substations and battery-charging stations should be ventilated by a separate split. High-voltage cables along headings are hazardous.



Larger trailing cables, welded rails and ballast resistors to limit short-circuit currents, with substations close to the workings, were among the suggestions offered by C. C. Conway, electrical engineer, Consolidated Coal Co. (Illinois). Concentrated mechanical mining simplifies the power-distribution problem. A new factor relating to safety is the cable-reel rubber-tired shuttle car operating without a grounded frame. A conducting rubber tire is being developed to carry insulation breakdown current from the car frame to ground.

What poor distribution costs in energy charges alone was illustrated by F. L. Stone, General Electric Co. Assuming a charge of 1c. per kilowatt-hour, he said, the following installation, which some

W. E. Wheeler, senior inspector, Kentucky Department of Mines and Minerals, Pikeville.

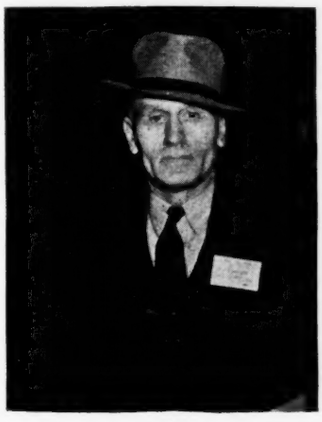
Henry Kinsman, master mechanic, Franklin County Coal Corporation, Royalton, Ill.

Thomas Durham, master mechanic, and Birch Brooks, superintendent, Saxon No. 1 mine, Walter Bledsoe & Co., Terre Haute, Ind.

Frank Weisenfelder (center), vice president, Richvein Coal Co., Cincinnati, Ohio; Herb Black (left) and Stan Alling (right), Keystone Coal Buyers' Manual.

T. F. McCarthy, general supt., Clearfield Bituminous Coal Corp., Indiana, Pa.

Tony Cline, electrician, Red Jacket Coal Corporation, Wyoming, W. Va.



G. J. Schaller, chief engineer, Red Jacket Coal Corporation.

W. F. Robinson, West Virginia Rail Co., and Carl Scholz, consulting engineer, Charleston, W. Va.

C. E. Lawall, president, West Virginia University, Morgantown.

C. A. Reis, owner, Green River Mine Co., So. Carrolltown, Ky.; Ernest Bean, owner, Bean Coal Co., Central City, Ky., and C. H. Tipping, mgr., coal-mining machine division, Sullivan Mfg. Co.

G. E. Hoover, Chesapeake & Ohio Railway Co., Huntington, W. Va.

Ray McDonald, general foreman, and W. S. Springer, washery engineer, Tenessee Coal, Iron & Railroad Co.

would consider reasonably good, would result in a yearly loss of $1,680: Substation 3,000 ft. from mining load; capacity and maximum load, 300 kw.; 500,000-cir.mil feed and a No. 4/0 trolley wire, 1,200 amp., 60-lb. rail return. If the substation were moved to within 1,500 ft. of the load and the same copper used but doubled, the loss would be cut $1,000.

Stressing the advantages of the new a.c. mining systems, Mr. Stone stated that the 24-hour loss with a d.c. substation must average at least 15 per cent, compared with 1 to 1.5 per cent at full load on modern transformers. A code of color standards for identifying cables is being seriously considered, said D. J. Hasinger, Wightman Supply Co. The first step in electrical safety underground, he thought, is the removal of explosive atmospheres from all areas where any electrical equipment is likely to operate.

Use of three-conductor cable in place of three single-conductor cables for underground distribution can be of great advantage in reducing inductive drop, said F. P. Brightman, General Electric Co. Use of a three-phase transformer instead of three single-phase transformers has space and headroom advantages for a.c. underground distribution.

Arc-welded Tires Hold Up

Only six of 902 tires arc-welded at the Old Ben Coal Corporation broke in the last three years, declared Frank B. Eubanks, maintenance superintendent. Welding was done with a ¼-in. rod, manually applied and without preheating, peening, annealing or special slow cooling. As a representative of the Mining Electrical Group of Southern Illinois, however, he expressed a preference for the automatic tire-welding practice of another large company where peening with an automatic hammer and then slow cooling with the tire cased in heat insulation follow the welding.

No limit has been found to the number of times a tire can be built up, said Mr. Eubanks. Rolled-steel wheels and resurfacing them by arc-welding is believed to give the lowest cost wheel maintenance in the district. Hub wear is the limiting factor. For best service in building up worn axles the worn section should be turned down so that the finished layer of new metal will be twice the thickness of the normal wear allowed.

Permissible equipment presents a special problem in maintenance. Without worker skill and close supervision, continued Mr. Eubanks, the flame-proofness may be destroyed by the first maintenance job on a new machine. Such instances have caused accidents costing thousands. The "flying squad," taking both welding-repair and ambulance trucks with them to the section, and the use of large tags—black on one side and white on the other—placed on the locomotive at the end of the shift to indicate at a glance a serviceable condition or a repair need are among the maintenance innovations in southern Illinois.

General maintenance was broken down into inspection, applied maintenance and improvements by Walter E. Housman, maintenance engineer, H. C. Frick Coke Co., in discussing Mr. Eubanks' paper. System in applied maintenance calls for detailed card records of all facts. Eventually these records become indicators of the necessity for general overhauls and of what parts should be kept on hand. Requiring operators to clean oil and grease from machines at the end of the shift shows up certain defects and eliminates a serious fire hazard.

Effecting close harmony between maintenance and operating men is the greatest problem, declared A. Lee Barrett, electrical engineer, Pittsburgh Coal Co., which operates 110 loading machines. Complete spare machines which "give both the maintenance men and the operating officials a chance" is an excellent investment. A program completely modernizing and restoring to original standards all loading machines has paid. Locomotives are now being given the same treatment. Adding filtered air breathers to control cases of flameproof locomotives is saving $200 per unit.

Cleanliness is a "first" in maintenance of substations and automatic controls, stated Mr. Brightman. Checking oil condition in circuit breakers and transformers, vulcanizing of slightly damaged spots of cables, placing space heaters under intermittent-duty motors operating in damp places and installing lightning arresters in combination with protective capacitors were among his other power-maintenance suggestions.

Fifty per cent of the machine failures, in the opinion of Harold S. Lowry, chief engineer, Snow Hill Coal Corporation, are due to faulty lubrication. Tightening oil cases, rebuilding seals and restoring running fits of loaders in Talleydale mine cut the consumption of lubricants 60 per cent (*Coal Age*, January, 1941, p. 82). In the case of ball bearings, suggested G. C. Hazard, Socony Vacuum Oil Co., providing a drain hole in the side opposite the filler and removing the plug temporarily from that hole to allow a show of lubricant as an indicator of sufficient filling solves the tough problem of limiting the lubricant to the proper quantity.

Two suggestions for lubricating loading machines working three shifts were offered. Mr. Barrett cited Pittsburgh Coal's success in restoring and improving all machines so that weekly lubrications suffice for all but "three or four points," which the operators look after. A. N. Porter, Socony Vacuum Oil Co., said one company uses a grease train with a four-man crew. With not over a 10-minute shutdown and in 6 minutes' actual time, this crew handles loading-machine lubrication on the shift.

Spotlighting Stripping

STRIPPING'S importance in the coal picture was recognized by two special sessions of the Cincinnati convention which covered the gamut from exploration in advance of development to maintenance methods at active pits. Most of the papers presented were based on practices of the large mines in Illinois, Indiana and Kansas. One address, however, had planning and working smaller strip operations as its theme.

Exploration for strip coal, explained Walter B. Roe, geologist, Truax-Traer Coal Co., is in most ways quite different from that for underground operations. Preliminary examination may be made by observing seam outcrops in valleys and, where there are no outcrops, by tracing the seam by coal fragments in streams and soil stained red by the oxidation of its underlying coal. Sometimes the seam may be located by its relative position to known outcrops of rock strata. Artificial pits, such as quarries, shafts and wells, also may reveal its presence.

Further prospecting, continued Mr. Roe, is carried on by drilling. This should start along the highest ridges to cut all strata and determine the maximum depth of overburden. Key holes should go below the seam for correlation purposes. Logs and elevations should be kept for each hole to help plan the method of stripping. Hand-powered earth augers are used in soil, clay, sand, gravel and soft shale. The hand-driven churn drill generally is used for medium hard rock and power churn drills, augers and rotary drills for hard strata and deep holes.

The objective of overburden preparation, according to Carl E. Walker, Ayrshire-Patoka Collieries Corporation, is to allow maximum employment of stripping equipment at the lowest possible operating cost. In preparing overburden, holes are made by churn, auger and rotary drills, both vertical and horizontal, in the bank. Mr. Walker illustrated his presentation with slides showing different methods of drilling, loading and shooting in varying overburden. Six to 14 holes are drilled and shot together, he said, when shooting banks with liquid oxygen.

Improvements in churn-drill construction, remarked Paul Wagoner, Maumee Collieries Co., have permitted increasing

(*Turn to page 54*)

J. W. Bullington, chief elect., Fiatt mine, Truax-Traer Coal Co.

Harry Bushong electrician, Consolidated Coal Co.

Gilbert Archer, deputy, Division Mines and Minerals, Dresden, Ohio.

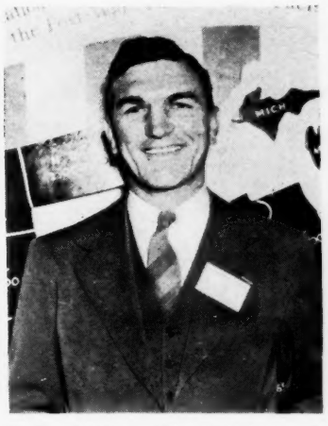
G. B. Bouser, chief electrician, No. 6 mine, Vesta Coal Co., Denbo, Pa.

C. O. Gallaher, Koppers Coal Co., Beckley, W. Va.

T. W. Guy, consulting engineer, Charleston, W. Va., and C. W. Waterman, McNally-Pittsburg Mfg. Corporation.

Reynold Carlson, electrician, Clearfield Bituminous Coal Corporation, Indiana, Pa.

H. L. Beattie, who is director of products, Koppers Coal Co., Pittsburgh, Pa.



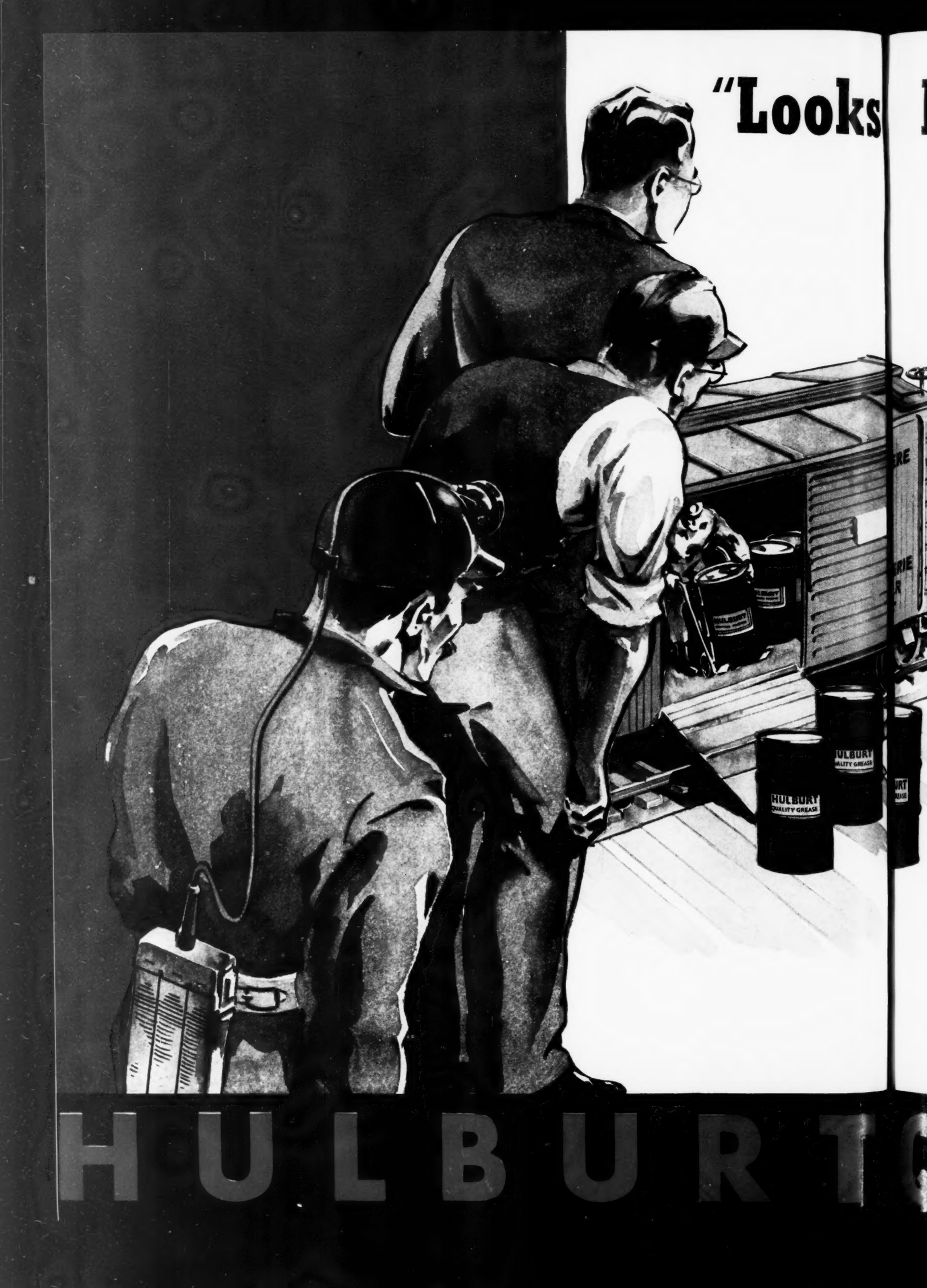
H. E. Hastings, Mine Safety Appliances Co. representative, Johannesburg, South Africa.

Charles W. Connor, general superintendent of mines, American Rolling Mill Co., Nellis, W. Va., and B. G. Shotton and A. E. Quere, Hendrick Mfg. Co.

S. K. Hissom Jr., superintendent, Banning No. 1 mine, Pittsburgh Coal Co., Cannonsburg, Pa.

H. D. Parnell, chief engineer, American Rolling Mill Co., Nellis, W. Va., and J. S. Wood, Jeffrey Mfg. Co.

W. R. Chedsey, director, Missouri School of Mines and Metallurgy, Rolla.


"Looks
HULBURT
QUALITY GREASE
HULBURT
HULBURT

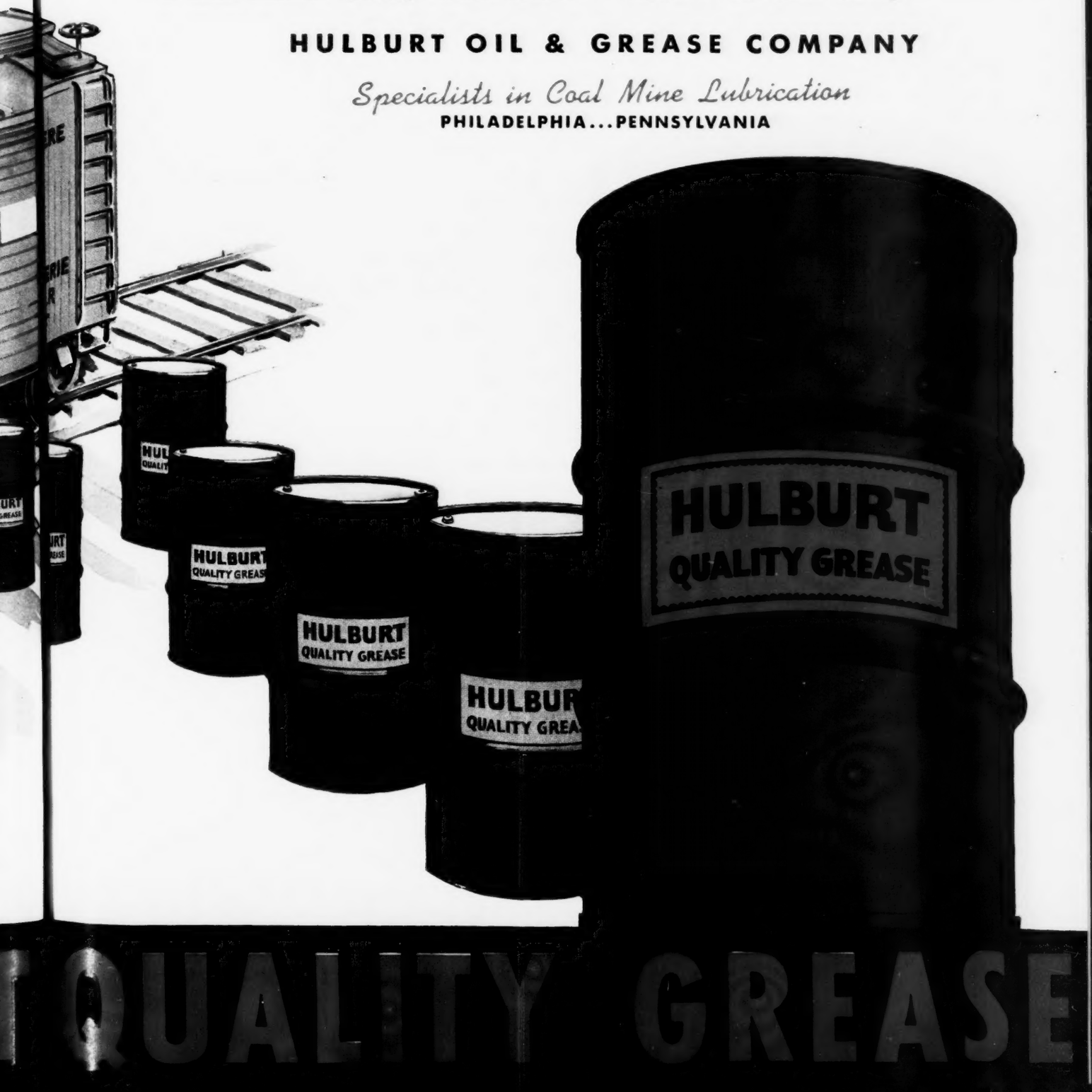
like our lubrication troubles are over"

Advertising often has prompted trial purchases, but it's on-the-job performance that proves a lubricant's real worth. Consequently it has always been our policy to make Hulburt Quality Grease demonstrate its efficiency and economy before a single penny changes hands. We have found it a good way to make friends and influence people. Write us today for a down-in-the-mine survey.

HULBURT OIL & GREASE COMPANY

Specialists in Coal Mine Lubrication

PHILADELPHIA...PENNSYLVANIA



bit diameter from 6 to 8 in. Drilling speed has been stepped up by heavier stems. At the Sentry mine, in western Kentucky, added Paul Horne, explosives engineer, Sinclair Coal Co., a specially designed motorized auger-type drill is used in hard sandstone. It is preferred to a churn drill because of its faster speed in this stratum—one hole in 1½ to 2 hours—and elimination of water lines.

Small Pits Predominate

Stripping accounts for 19.1 per cent of the Ohio output, stated F. R. Phillippi, vice president and treasurer, Dye Coal Co., and two-thirds of that percentage comes from small operations. Highly mobile equipment is desirable because the strip areas are small and consist of several pits. With rock strata above the coal, shovels 50 to 100 tons in weight, with 30- to 43-ft. booms and 2½- to 3-cu.yd. dippers, are used for stripping. High parts of the terrain are removed by Carryalls and scrapers.

One of the chief problems of the small stripper is to find adequate spoil room. Rock is broken by a sidewall drill. Bulldozers and brooms clean the coal surface. Haulage is by end-dump trucks. Preparation must be good at these operations in order to compete with the large mines. The preparation plant should be centrally located with respect to the various pits.

The Hanna Coal Co., said C. C. Hagenbuch, mining engineer, is now working a strip pit in conjunction with an underground drift mine. At each strip location a drift opening is made to the underground mine. The strip tonnage is dumped into a large bin and then loaded into mine cars hauled by the mine locomotive through the drift operation to the preparation plant. At the Marriott-Reed Coal Co. in Missouri, observed A. F. Marriott, president, a dragline is preferred to a shovel because of making a wider pit, ease of moving between pits and its availability for ditching (*Coal Age*, December, 1940, p. 67).

Road-building methods at mines of the United Electric Coal Cos. in Fulton and St. Clair counties, Illinois, were described by Eric E. Laurell, superintendent, Buckheart mine. At Buckheart, the haul is 2.6 miles per round trip and each truck averages 67.5 miles per day. Road ballast for this haulage was taken from nearby gravel banks and laid over the top of the graded surface.

How Roads Are Built

The base of the Buckheart road was made by having the road patrol pack tight the sandy yellow loam and clay of the natural earth, crowning the base as far as possible with the patrol blade. When possible, returning empty trucks were routed over the section to pack the base, which later was covered with four layers of burning "gob" (preparation-plant refuse) each so rolled as to be about 3 in. thick. A thin layer of ¾x2-in. screened gravel, worked into the gob by roller, road patrol and traffic, followed.

Next, explained Mr. Laurell, "earth-bound gravel,"—i. e., ¼x0-in. material mixed with some sand and clay—was applied in four 1-in. layers. During this time and for a month afterward, the roadway was consolidated by traffic. The roadway was then formed by the auto patrol and crowned to fit the duo-wheels of trucks and semi-trailers. In preparation for the sealing coat, traffic was routed away from the roadway, which was then smoothed by roller and auto patrol, and sprinkled if dusty.

The road was then shot with Walker's road oil and treated with just enough coarse sand to cover the oil. To help the oil soak into the gravel, continued Mr. Laurell, the coating usually was applied in hot weather and over a week-end. Traffic was then resumed for about a month. For a week perhaps after oiling, earth-bound gravel in two or three 1-in. layers was worked and molded into the road surface by travel-packing without scarification. Breakage of the oiled surface would have been undesirable. Lugged tractors were excluded from the road bed.

Oil Coating Roads

Finally an oil coat was applied and then covered with a 1-in. layer of ¾x¼-in. pea gravel. In winter, ¾-in. crushed limestone was applied to road shoulders, tire paths and small chuck holes. Another system is followed at Red Ray mine in St. Clair County, where Bitucote, an emulsified asphalt, and unburned preparation-plant refuse are used. The best time for road building, according to Mr. Laurell, is from May to September. Cost was $3 per foot. Maintenance of the Buckheart road requires two man-days labor each working day: one man is a laborer and the other is on the road patrol or sprinkler.

Successful maintenance, said George E. Nettles, general superintendent, Pittsburg & Midway Coal Mining Co., is a matter of tools, materials and men. On the tool side, first place goes to the electric welder and the oxyacetylene torch. Many operators also consider a well-appointed machine shop essential. Because of the defense program, it may be necessary to carry larger stocks of repair parts, for the supply situation "is likely to become alarmingly serious."

Strip-Pit Maintenance

In case of failure of either high or low gear in the caterpillar casting of an excavator, either the high or low pinion can be made inoperative by cutting at least two additional teeth from the impaired part and holding the pinions out of mesh by welding a piece on the pinion and then welding to the inside of the casting. The four cats, explained Mr. Nettles, can then be removed either as a unit in high or low gear, as the case may be, but it will be impossible to steer the caterpillars until more permanent repairs have been made.

Where aluminum dippers are used, he continued, the full surface of the aluminum can be covered by light armor plate which can be removed and replaced quickly. Welding high-manganese dipper castings has become an every-day occurrence. Drum-type dipper-door shock absorbers have practically eliminated destructive door slam and thus reduced maintenance. One mine has developed electric heaters for dipper and dipper handles to keep frost out of those members and so possibly forestall failure.

Maintenance absorbs 23 to 30 per cent of the man-hours at a stripping operation, said Gene H. Utterback, production engineer, Enos Coal Mining Co. All the points which must be watched in electrical equipment should be specified in writing and their condition reported. Little cracks in equipment should be welded before they become large, added R. M. Sweeney, Truax-Traer Coal Co. The application of hydraulic stripping at Pyramid Coal Corporation, detailed in *Coal Age*, November, 1940, p. 41, was described by R. E. Henderson, general superintendent of the company.

Mechanizing Coal Mines For National Defense

New and improved equipment, supplies and services for low-cost mechanical mining and better national defense shown at the 18th ANNUAL EXPOSITION OF MINING EQUIPMENT OF THE AMERICAN MINING CONGRESS

E. J. Burnell
New Chairman, Manufacturers' Division
American Mining Congress

OVER 135 manufacturers and service organizations participated in the equipment show at the 18th Annual Coal-Mining Convention and Exposition, held at the Music Hall, Cincinnati, Ohio, April 28-May 2, under the auspices of the Manufacturers' Division of the American Mining Congress. E. J. Burnell, vice president, Link-Belt Co., was elected division chairman for the coming year, succeeding A. S. Knoizen, vice president, Joy Mfg. Co. John C. Haddock, vice president, Sullivan Machinery Co.; George E. Stringfellow, Thomas A. Edison, Inc.; and H. V. Brown, vice president, Brown-Fayro Co., were chosen vice chairmen.

Mechanical cutting, drilling, loading and conveying equipment, reflecting greater stress on lowering costs to improve the industry's position in the national defense program, led the list at the exposition. Equal emphasis was placed on bigger mine cars, rubbed-tired haulage and conveyors to improve loading efficiency. New electrical equipment for mechanical mining held its share of the limelight, along with improved materials, supplies and maintenance equipment. Safety, with especial attention to rock-dusting, dust control and protective clothing, along with better ventilation, was the theme of many exhibits. For the details of these and other developments, see the following pages.

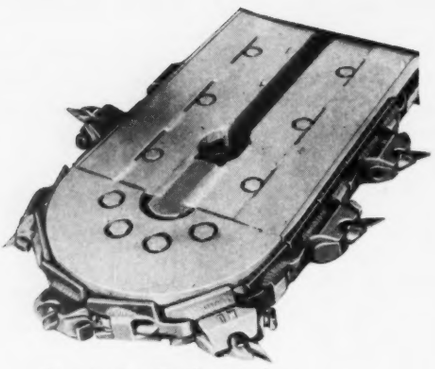


Fig. 1—Bowdil alloy-steel Z-type cutter bar.

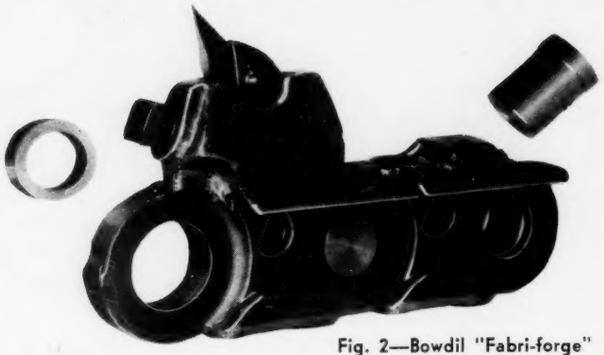


Fig. 2—Bowdil "Fabri-forge" cutter chain.

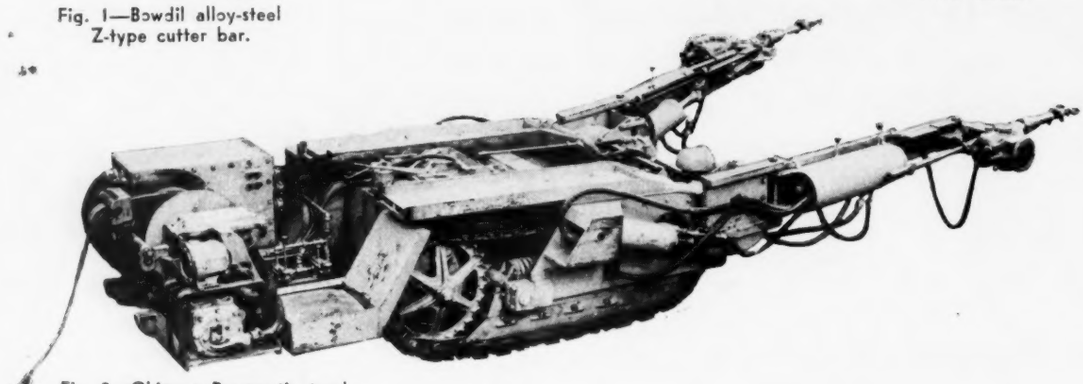


Fig. 3—Chicago Pneumatic truck-mounted coal drill.

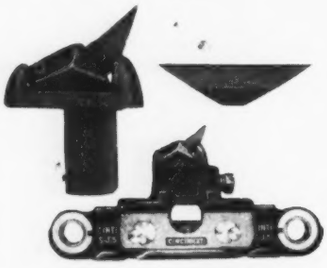


Fig. 4—Cincinnati "Stanex" bit unit.

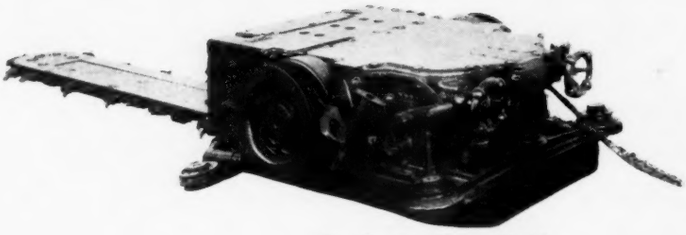


Fig. 5—Goodman 612-AB 35-hp. shortwall.

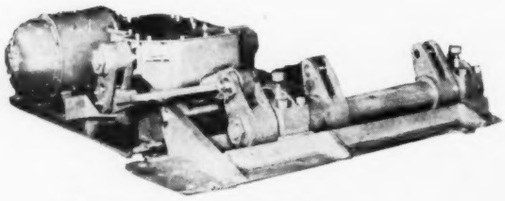


Fig. 6—Goodman GS15-B-74 shaker-conveyor drive.

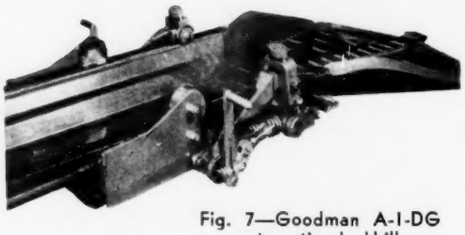


Fig. 7—Goodman A-1-DG automatic duckbill.

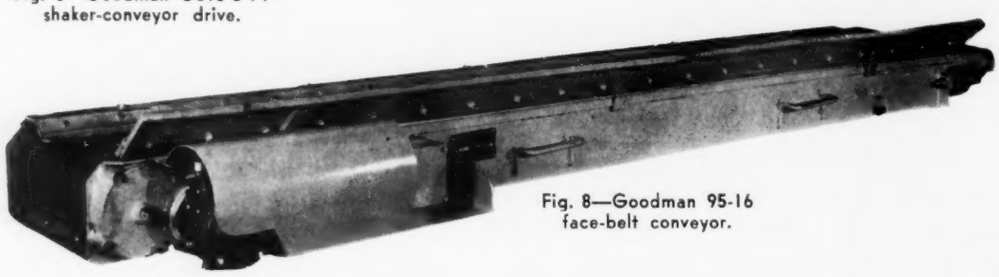


Fig. 8—Goodman 95-16 face-belt conveyor.

Mechanical Coal-Production Equipment and Aids

Barber-Greene Co., Aurora, Ill.—Photographic display of underground conveying equipment, including special Barber-Greene drag and belt conveyors, such as a low-head belt unit with 5-in.-high frame; also transfer hoppers for underground service.

Bethlehem Steel Co., Bethlehem, Pa.—Hollow drill steel.

Bowdil Co., Canton, Ohio—Solid-alloy heat-treated cutter bars and chains, secondary cutter bits and drill heads and bits, including the new Bowdil alloy-steel Z-bar (Fig. 1) and chain (Fig. 2). The new bar, it is stated, has nearly double the strength and resistance to spreading of the guides, making it possible to cut a smaller kerf and make coarser bugdust with less power. The bar accommodates the new thin-faced bit, stated to be 20 per cent more efficient than previous models, with holder loss eliminated. Pressure tests on the bar between 3-ft. centers show that the Z-bar 3 in. thick will support a load of 80 to 85 tons without bending, compared with 65 to 70 tons for the Bowdil 3-in.-thick solid-steel bar and 25 to 35 tons for conventional bars 4 in. thick.

Features of the new "Fabri-forge" chain include: radial track guide allowing the chain to circle the head smoothly at the correct angle without damage to guide or wearing strip; drop-forged lug body and symmetrical connector of equal strength; large, locked, hardened pin and bushing to take wear (easy to connect, remove and replace); a bit-carrying body securely welded on to suit any condition of position, lacing and kerf; and one-piece holder, wedging bit securely in lug projection and eliminating loss.

Bucyrus-Erie Co., South Milwaukee, Wis.—Photographic display of shovels, draglines, overburden drills and other strip-mining equipment.

Chicago Pneumatic Tool Co., New York—Portable electric and pneumatic drills, representative items in the company's line of 14 permissible and open-type post-mounted and hand-held electric coal drills, and a new self-propelled truck-mounted coal drill equipped with tractor treads and two drill arms actuated by hydraulic pressure (Fig. 3). The arms can be furnished in lengths suitable for various heights of coal and widths of places. Either storage-battery or cable-reel power is available, as well as tractor treads or rubber tires for trackless-mining systems or flanged wheels for track operation.

Cincinnati Mine Machinery Co., Cincinnati, Ohio—Coal-cutting equipment—bars, chains, "Duplex" bits, etc.—for both standard and thin-kerf work, including a new cutter bar for 29-U equipment of the box type, eliminating the sliding split head, and a combination bar lock and pull-along for shortwalls which makes it impossible to start the chain until the machine is spotted in cutting position. Also featured was the new and smaller "Stanex" bit and mounting (Fig. 4). While not designed to supplant the "Duplex" bit and chain, the "Stanex" unit is offered for such work as thin-seam conveyor mining where transportation is a problem. The "Stanex" may be employed in all chains using ½x1-in. bits and is light in weight (100 per 7½ lb.) and low in cost, the company states. Shank design keeps the assembly tight and prevents bit and holder losses. The bits are quickly set and automatically gaged.

Enterprise Wheel & Car Corporation, Bristol, Tenn.-Va.—Smith "dragline conveyor," or "scooter," method of mining coal (*Coal Age*, May, 1940, p. 29; September, p. 47; May, 1941, p. 52).

Goodman Mfg. Co., Chicago—Loading, cutting and conveying equipment, including a line of shaker-conveyor drives now made with Goodman motors, such as the G-12½, G-20, E-11, JL-10 and the new low-cost K-8 units. Cutting equipment on display embraced the 512 universal-control de luxe shortwall, and conveying equipment the improved 97C-30 belt group with 20-hp. motor and a capacity of 190 tons per hour. A new frame-to-frame angle construction facilitates inspection or moving.

Among the new cutting machines was the 612-AB universal control de luxe shortwall with 35-hp. motor designed primarily for conveyor mining and fitted with a Type 41-B chain (Fig. 5).

Shaker-conveyor equipment included the new GS15-B-74 side drive with Size 1½ connecting trough, Size 1 swivel and new A-1-DG telescopic duckbill. With B motion, 74 strokes per minute, the design of the GS15-B-74 drive (Fig. 6) permits setting the motor to one side to reduce height, while at the same time providing the advantages of the underneath drive, such as less whipping and weaving and smoother operation.

The new A-1-DG telescopic duckbill is described as an extremely short (14-ft. 3-in.) unit consisting of three principal sections which telescope within themselves. A cast shovel end (Fig. 7) streamlines the unit and insures longer wear, it is stated, as well as easier coal flow. The duckbill is fully automatic.

Another new Goodman item was a 95-16 face-belt conveyor (Fig. 8) with a capacity of about 25 tons per hour and designed for use singly or in series.

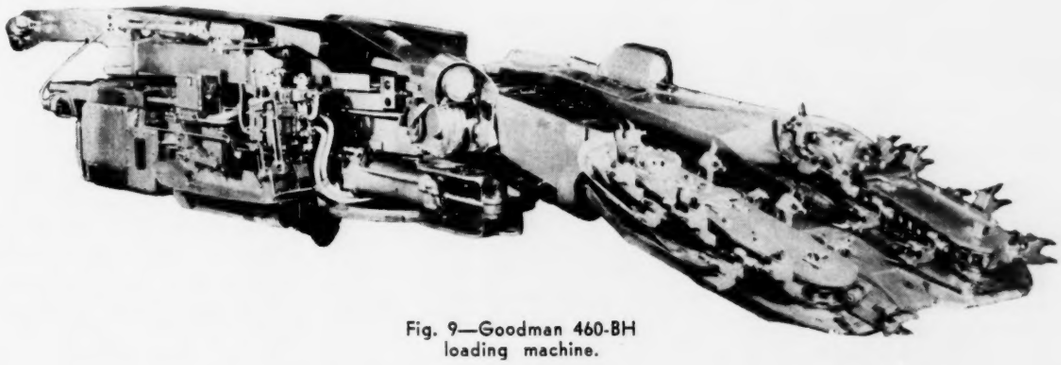


Fig. 9—Goodman 460-BH loading machine.

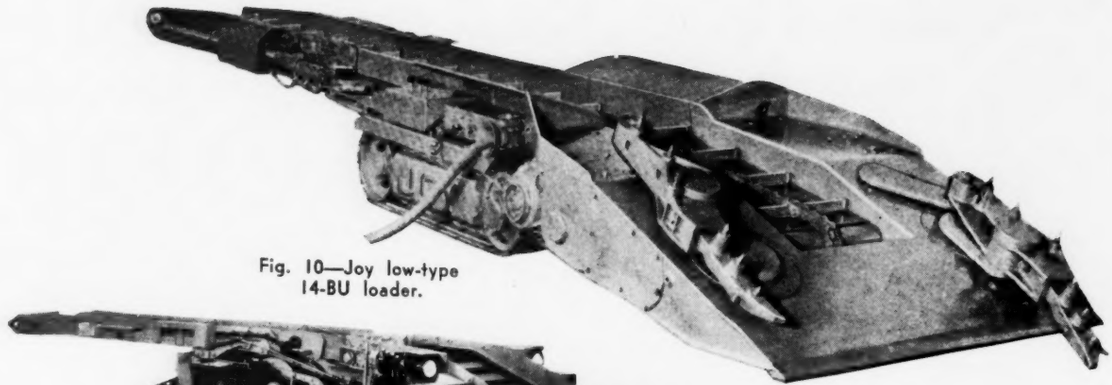


Fig. 10—Joy low-type 14-BU loader.

Fig. 11—Whaley low-style "Automat" loader.

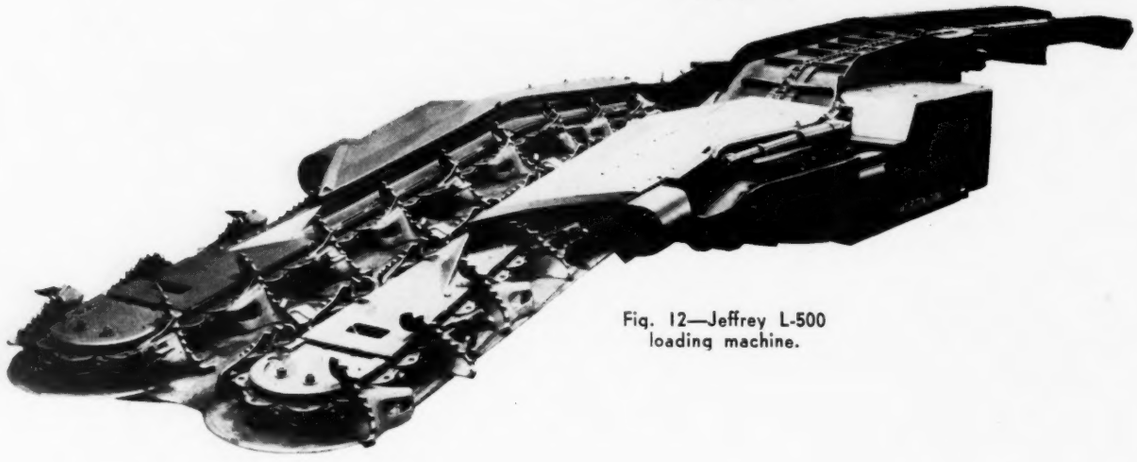


Fig. 12—Jeffrey L-500 loading machine.

Leading the Goodman loading-machine display was the 460-BH government-approved hydraulically controlled track-mounted unit (Fig. 9). Although similar in design to the 360 machine, the 460 unit has been built, according to the company, to work on sharp-angle curves such as encountered in pulling pillars or in places where close posting is the rule. The loading head can be swung 55 deg. to each side of the track center line. Rear-conveyor swing is 40 deg. Height to the top of the rear conveyor ranges from 40 to 44 in.

Jeffrey Mfg. Co., Columbus, Ohio—A-7 hand-held and A-6 post-mounted electric coal drills; 29-U universal hydraulically controlled track-mounted cutting machine; 61-HG face conveyor and 61-AM room conveyor with diverging head; other mechanical-mining equipment; and the new Jeffrey L-500 track-mounted loading machine with an over-all height of 31 in. above the rail. The L-500 machine (Fig. 12) is rated at 6 tons a minute in loose coal, with an average loading rate, taking in digging and clean-up, of 3 tons a minute. With hydraulic controls and powered by a 50-hp. motor, the machine has a front-conveyor swing of 45 deg. to each side of the track center line, with 40 deg. for the rear conveyor.

Joy Mfg. Co., Franklin, Pa. Joy Jr. loading machine for seams as low as 30 in. (rated capacity, ¾ ton per minute; maximum, 1½ tons), Joy 14-BU high-capacity loading machine for seams as low as 36 in. (rated capacity, 5 tons per minute), and the Joy safety coal drill, plus a photographic display of other mechanical-mining products. The special low 14-BU (Fig. 10) has an over-all height of 26 in., weighs 7 tons and is powered by five motors totalling 27½ hp.

La-Del Conveyor & Mfg. Co., New Philadelphia, Ohio—Underground chain, belt and shaker conveyors, including the new U-17 large-capacity shaker conveyor (3 to 3½ tons per minute) for use with loading machines or for gathering purposes. Drive and drive section are mounted on one baseplate so that they may be moved as a unit. La-Del also showed the new V-18 crawler-mounted loading machine (Fig. 13) designed to load into mine cars, shuttle cars or conveyors. It can be used in coal as low as 30 in. and rheostat controls provide for varying the loading rate (reciprocating loading head) from 30 to 100 tons per hour, the manufacturer states. Weight is 5 tons, controls are hydraulic and three motors aggregating 25 hp. provide power. The rear conveyor has a swing of 90 deg. to each side.

Link-Belt Co., Chicago—Pictorial display of shovels and draglines.

Marion Steam Shovel Co., Marion, Ohio—Photographic display of stripping and loading units, featuring knee-action Tecumseh Coal Corporation equipment.

Myers-Whaley Co., Knoxville, Tenn.—New 3-L-S low-style Whaley "Automat" coal-loading machine with permissible equipment, shovel-loading motion and parallel-lift rear conveyor (Fig. 11). With extra speed for rapid tramming and powered by one 25-hp. motor, the 3-L-S has an over-all height of 40 in. and a guaranteed operating capacity of 3 tons per minute; maximum, 7 tons.

Frank Prox Co., Inc., Terre Haute, Ind.—Cutting equipment for all types of machines, including the standard "Invincible" cutter chain and the newest Prox "Invincible ToolSteeL" chain and bit (Fig. 14). This hardened alloy-steel bit has a circular back for strength, which "is perfectly embraced by the toolpost, with the flat front face wedge-locked against an inclined surface ahead. The 'Mac-It' screw 'steps on the toe' of the toolpost, and working forces simply help tighten up this wedge-lock, yet the bit may be changed quickly. Once locked, neither the bit nor tool post can lose out, nor can the bit be improperly set, insuring absolutely uniform bit gage. The toolpost may be removed by turning the screw several times, no 'bite' of screw being required to keep it in, insuring positive locking action without back-straining effort."

Stephens-Adamson Mfg. Co., Aurora, Ill.—Underground conveying equipment.

Sullivan Machinery Co., Michigan City, Ind.—Two new scraper haulers—the J-215 and the J-216 (Fig. 15)—especially designed for use with the Smith drag-line conveyor, or "scooter," system of mining; a complete line of pneumatic drills; and a complete list of shortwall cutters, including the 9-B adjustable floor-type overcutter, the 7-B "Super" shortwall, the new 5-B-1 "Buddy" shortwall, and the new 11-B shortwall; also pictorial presentations of the 7-AU track-mounted universal cutting machine, Sullivan scraper equipment, the "Lo-Hite" rock loader, etc.

The 5-B-1 "Buddy" machine (Fig. 16), the company points out, is patterned after the 7-B machine, but is cut down proportionately for smaller operations and conveyor work where a 13-in.-per-minute cutting speed is adequate and cutting is relatively easy. It is equipped with a 10-hp, motor and carries cutter bars varying from 4½ to 6½ ft. in length making a 2½-in. kerf and delivering the cuttings to the rear. Over-all height without truck is 17¾ in.

The 11-B machine (Fig. 17) is powered with a 35-hp. motor. Over-all height is 21 in., yet the machine can cut a standard kerf and deliver the cuttings to the rear. Low height and short length, according to the company, especially adapt the unit to conveyor mining. Maximum cutter-bar length is 6 ft. Kerf thicknesses are 4, 5 or 6 in.

Timken Roller Bearing Co., Canton, Ohio—Detachable rock bits.

Fig. 13—La-Del V-18 loading machine.

Fig. 14—Prox "ToolSteeL" chain and bit.

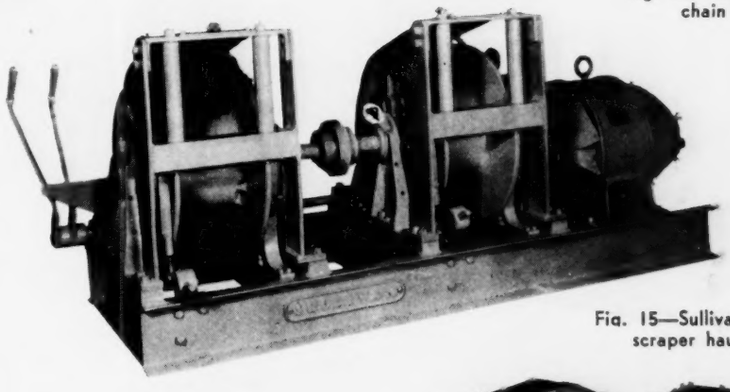


Fig. 15—Sullivan J-216 scraper hauler.

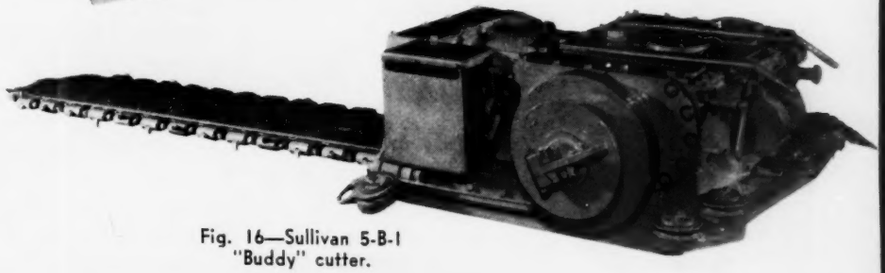


Fig. 16—Sullivan 5-B-1 "Buddy" cutter.

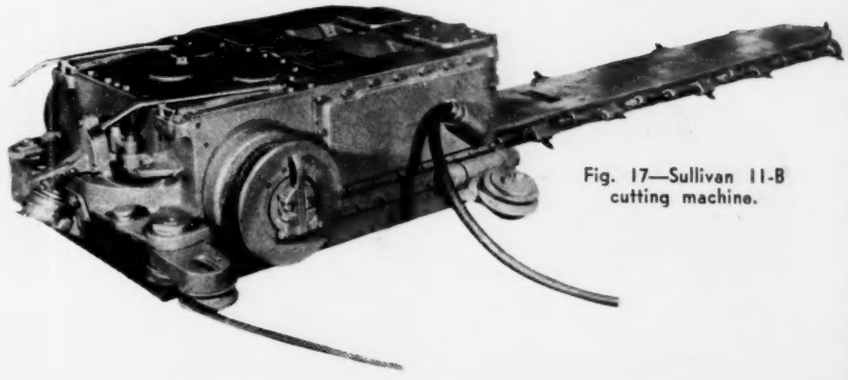


Fig. 17—Sullivan 11-B cutting machine.

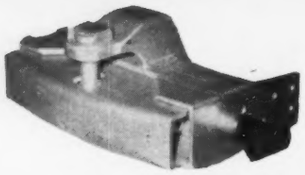


Fig. 18—A.C.F. double-action spring bumper.

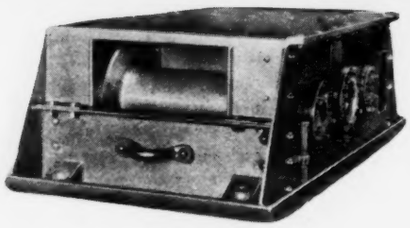


Fig. 19—Brown-Fayro HKM car-spotting hoist.

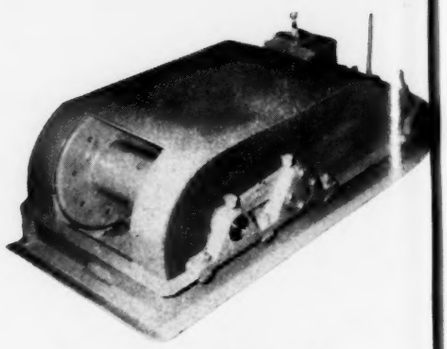


Fig. 20—Flood City Type CS-3 spotting hoist.

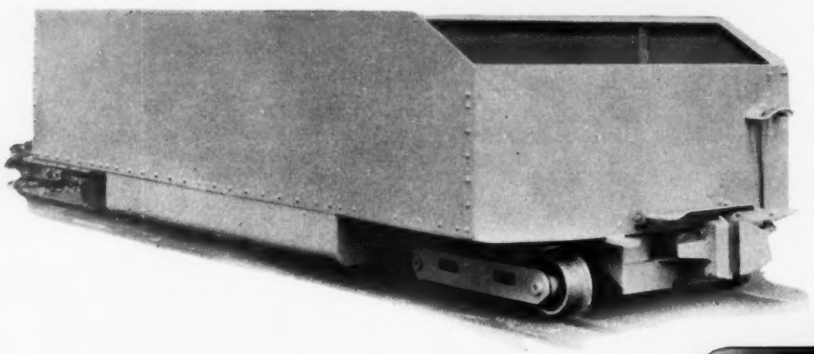


Fig. 21—Differential 354-cu.ft. "Axless" car.

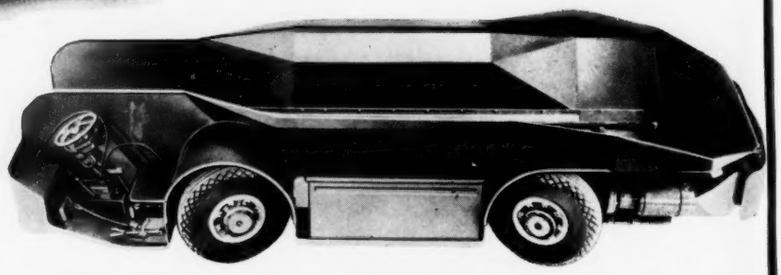


Fig. 22—Joy four-wheel-drive four-wheel-steer shuttle car.

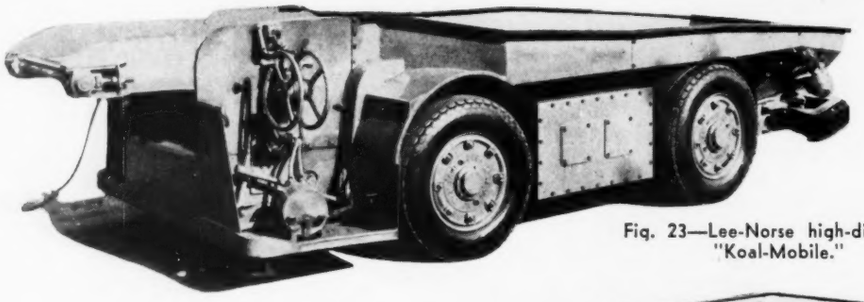


Fig. 23—Lee-Norse high-discharge "Koal-Mobile."

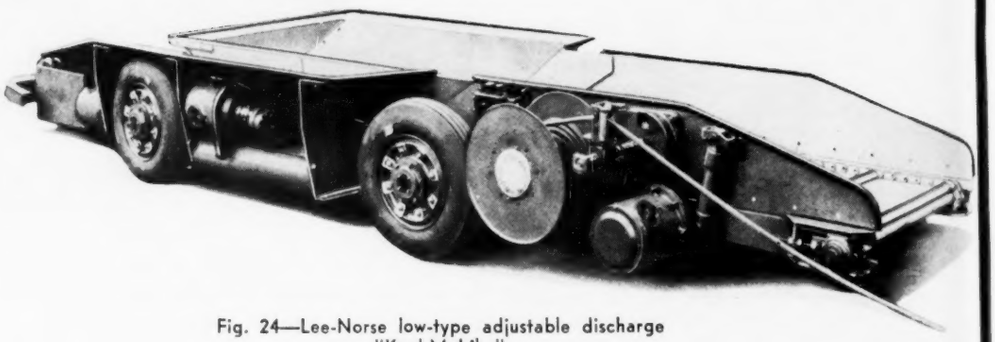


Fig. 24—Lee-Norse low-type adjustable discharge "Koal-Mobile."

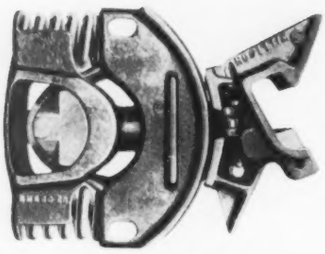
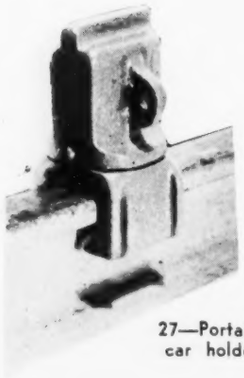


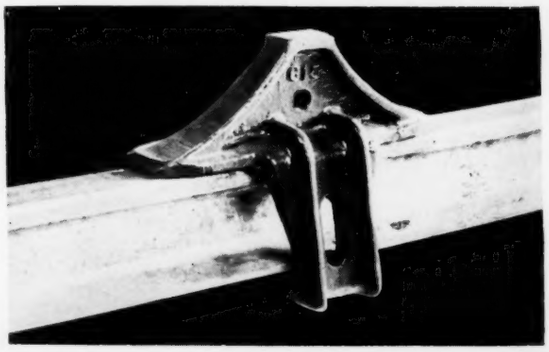
Fig. 25—New-type Willison automatic coupler.

Fig. 28—Portable safety block.

Fig. 26—Portable "Streamlined" switch signal.



27—Portable Hill car holder.



Track and Trackless Haulage Hoists and Auxiliaries

Air Reduction Sales Co., New York—Fabrication of switch points and frogs with the No. 10 "Radiagraph" cutting equipment; rail welding with "Airco" No. 78 electrode.

American Car & Foundry Co., New York—A.C.F. special-mixture heat-treated wheels in various types for various bearings; A.C.F. heat-treated hitchings; the A.C.F. double-action four-spring bumper (Fig. 18) designed for use not only with new cars but for installation on old cars to convert them into modern equipment; and the Kelleys Creek Colliery Co. mine car of the box-type through-axle construction. Weighing 5,100 lb., the car on display had been in service over a year. Level-full capacity is 175 cu. ft. Dimensions are: over-all length, 11 ft. 2½ in.; width, 6 ft. ½ in.; height over the rail, 42 in.; wheelbase, 36 in.; track gage, 44 in.

Bethlehem Steel Co., Bethlehem, Pa.—Display of track materials, such as a complete steel-tie room switch with target stand, malleable-iron heel blocks, spring rod and switch stand; steel mine ties; Koppers "AR-Moored" steel-and-wood ties; forged mine-car wheels on a through axle mounted on 40-lb. A.S. rails on steel ties equipped with guard-rail chairs and guard rails; coupling links and pins; and "Mayari-R" light-weight corrosion-resisting mine cars.

Brown-Fayro Co., Johnstown, Pa.—"Brownie" Model HGD conveyor auxiliary hoist; "Brownie" rerailers; and other transportation products, including the new "Brownie" Model HKM conveyor car-spotting hoist (Fig. 19) equipped with built-in contactor control, palm-operated pushbutton starting and a set of three roof jacks. A low-seam unit, the hoist stands 20 in. high and has a rated rope pull of 6,000 lb.

Carnegie-Illinois Steel Corporation (subsidiary United States Steel Corporation), Pittsburgh, Pa.—U.S.S. steel mine ties, rails and other track materials; the new U.S.S. sectionalized steel-tie turnout, consisting of a turnout with steel ties cut into sections for easy moving and laying; also a photographic display of "Cor-Ten" light-weight corrosion-resisting mine cars.

Differential Steel Car Co., Findlay, Ohio—Photographic display of Differential "Axless" locomotives and Differential mine cars; also one of 100 new cars for the Arkwright Coal Co. (Fig. 21). With eight "Naco" cast-steel Timken-bearing wheels, "Axless" trucks and brakes on the four wheels on one end, the cars are made of "Cor-Ten" steel partly riveted and partly welded. Weight is 6,800 lb. per car; capacity, 354 cu.ft., or 10 tons, level full, and 11½ tons mechanically loaded. Dimensions are: length, 15 ft. 4 in. inside; width, 7 ft.; height over rail, 50 in. Willison automatic couplers are used.

Enterprise Wheel & Car Corporation, Bristol, Tenn., Va.—Four-axle steel rotary dump car 34-in. high, 7 ft. wide and 12 ft. long holding 5 tons level full (spring bumpers on both ends), and a model of a steel 4-axle low-vein car with sloping end for end and crossover dumps, the coal sliding out.

Flood City Brass & Electric Co., Johnstown, Pa.—New Type CS-3 low-vein car-spotting hoist (Fig. 20). Height of hoist is 20 in.; weight with motor, 2,025 lb. Rope capacity is 500 ft. of ⅝-in.; 750 ft. of ½-in. Rated pull is 6,000 lb. at 25 f.p.m. with a 5-hp. motor. The hoist is made with a special non-reversible worm drive and ordinarily is supplied with a newly developed special ball-bearing motor, although any low-type motor may be used.

General Electric Co., Schenectady, N. Y.—General Electric "Sealed-Equipped" 8-ton gathering locomotive of the type furnished Montour No. 4 mine, Pittsburgh Coal Co. Among its features are standard low-speed d.c. motors, drum-type control, edgewise-wound accelerating resistors, floating-type cable reel, forced-ventilation line breaker with flame arrester and quick-acting brake rigging.

Gibraltar Equipment & Mfg. Co., St. Louis, Mo.—Car stops, rerailers, derailers, pressed-steel wheels, light tool trucks with pressed wheels, combination tools with interchangeable heads for different types of work, rail levelers, and "Gemco Tru-Blu" standard and ratchet-type rail benders and rail punches, including the multiple-leverage rail punch up to the 70-lb. size.

Jeffrey Mfg. Co., Columbus, Ohio—Jeffrey hydraulic braking system for mine locomotives.

Joy Mfg. Co., Franklin, Pa.—In addition to previous types, Joy featured the new four-wheel-drive four-wheel-steer shuttle car (Fig. 22). This 2SC car has a capacity of 6 to 7 tons and is fitted with two 5-hp. traction motors and a 5-hp. conveyor motor. Traveling speeds are 5½ m.p.h. empty and 4 m.p.h. loaded. The unit requires for turning a minimum outside clearance radius of 16 ft. 10½ in.; inside, 7 ft. 8 in.

Lee-Norse Co., Charleroi, Pa.—New Models 462-A and KMC-431A four-wheel-drive four-wheel-steer "Koal-Mobiles." The high-discharge 462-A model (Fig. 23) is equipped with an adjustable-height discharge conveyor for loading directly into mine cars, thus eliminating transfer stations. Clearances for turning are: outside, 17 ft. 1 in.; inside, 6 ft. 7 in. The low (30-in.-high) KMC-431A "Koal-Mobile" (Fig. 24), equipped with automatic cable reel, is fitted with a hydraulically controlled discharge end to permit adjustment of the height of discharge. Turning clearances are: outside, 17 ft. 3 in.; inside, 7 ft. 6 in. Steering is done hydraulically.

Link-Belt Co., Chicago—Link-Belt mine- and slope-conveyor equipment (shown pictorially), Link-Belt rotary railroad-car dumpers (models and pictures) and a complete Link-Belt push-button controlled rotary mine-car dumper in operation.

Mack Trucks, Inc., New York—Mack-Lanova diesel engine for strip-mine haulage and a complete photographic display of Mack tractors and trucks used in the stripping industry.

Mancha Storage Battery Locomotive Co., Chicago—Pictorial display of battery locomotives.

Metal & Thermit Corporation, New York—Rail-welding by the "Thermit" process.

Mine Safety Appliances Co., Pittsburgh, Pa.—M-S-A "Velocity-Power" rail punches, using blank cartridges to perform the punching operation, car stops, etc.

National Malleable & Steel Castings Co., Cleveland, Ohio—"Naco" cast-steel mine-car wheels, hitchings, friction-type draft gear and Willison automatic mine-car couplers, including new self-centering and non-self-centering units designed so that buffing on a pin or at the end of a shank is eliminated, thus preventing "jack-knifing" or "riding" cars off the rails when pushing trips. The buff in these couplers (Fig. 25) is taken on a buffing circle, from which the force is transmitted back to springs. In couplers for rotary-dump operation, holding springs are provided so that in case a triprider jumps on the coupler it will not turn and throw him off.

Ohio Brass Co., Mansfield, Ohio—O-B automatic mine-car coupler employing rubber draft and buffing pads and self-contained self-centering device.

Portable Lamp & Equipment Co., Pittsburgh, Pa.—Portable line of "Track Tackle," comprising mine-car rerailers and derailers, transition rails, compromise rail splicers, hinged car holders for use at the face and elsewhere, and mine-car skids (both running and hold-

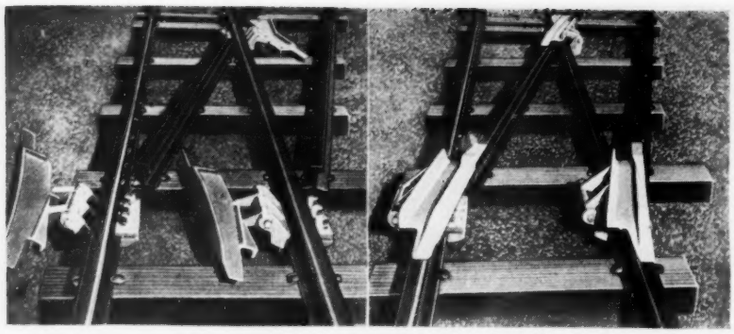
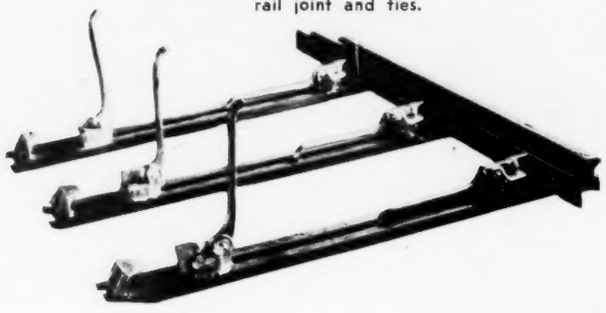


Fig. 29—Portable switch connectors.

Fig. 30—West Virginia offset rail joints.

Fig. 31—West Virginia safety switch throw.

Fig. 32—Tamping Bag Co. temporary rail joint and ties.



ing). A new item was a "Streamlined" switch signal (Fig. 26) said to be almost 50 per cent lower in first cost and employing red and green reflector disks instead of electric lights, wiring and contacts. A paddle connected to the bridle bar moves back and forth to cover and uncover the disks.

An automatic car holder (*Coal Age*, March, 1941, p. 120) employs a counterweight to return the holder to working position after cars pass over it. To hold a car at the face, Portable also offered the new Hill car holder (Fig. 27), stated to be strong, efficient and low in price. The holder clamps on the rail, and provision is made for using a small bar or handle so that the workman need not get his hand close to the rail. Another new item was the Portable safety block (Fig. 28), described as small, light in weight and made in one piece. Primarily for use on heavy grades but also as a "face" stop, the block is designed to rest against a wood or steel tie.

Switch connectors (Fig. 29) were another new Portable offering. They are designed to permit installation of a temporary switch without cutting the main track. Two turnouts and a frog assembly are used and are hinged to bases which are bolted to the through rails. Two combinations, corresponding to the conventional Nos. 2 and 4 frogs, are available.

Sanford-Day Iron Works, Inc., Knoxville, Tenn.—Crescent Coal Co. "1-2-3 Automatic" drop-bottom car, S-D "Floater" anti-friction-bearing wheels, S-D hitchings and rope rollers and S-D ball-bearing tool and drill trucks.

Tamping Bag Co., Mt. Vernon, Ill.—Temporary rail joint for use at the face and elsewhere. Special ties (Fig. 32) are fitted with lever-operated cam-type locking units and special outside clips. To make a joint, a short length of rail is placed with its ball against the webs of the rails to be joined. By depressing the levers, this short rail is locked against the main rails.

Watt Car & Wheel Co., Barnesville, Ohio—Mine cars and Watt-Dalton bumpers in pictures and models.

Weir-Kilby Corporation, Cincinnati, Ohio—Representative items from its line of track equipment, including Weir "Titan" frogs.

West Virginia Rail Co., Huntington, W. Va.—Steel ties, steel-tie switches, sectionalized steel-tie turnouts, cast and riveted frogs, new offset rail joints (Fig. 30) made of rail sections and thus capable of manufacture in any desired length, and a new safety switch throw (Fig. 31). The switch throw is of the self-locking toggle-motion parallel-throw type and is designed primarily for mechanical mines. No overhung bearings are used, making for permanence, and the throw is low and the connecting rod is fully inclosed to offer a minimum of obstructions.

Westinghouse Air Brake Co., Wilmerding, Pa.—Westinghouse hydraulic-brake equipment for mine locomotives. It is designed for use on locomotives weighing about 10 tons (or two such units in tandem), but can be applied to larger equipment. The hydraulic system operates the regular brake levers and the customary hand brake is retained intact.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.—Vesta Coal Co. 8-ton gathering locomotive with explosion-tested equipment throughout, including lever-type brakes and other special features.

Wood Preserving Corporation, Pittsburgh, Pa.—Pressure-treated ties and timber and Koppers "AR-Moored" combination steel and treated-wood ties for room and room-entry service.

Coal Preparation and Utilization Equipment and Methods

Allis-Chalmers Mfg. Co., Milwaukee, Wis.—Horizontal "Low-Head" vibrating screen and the new Allis-Chalmers "Ripl-Flo" vibrating screen (*Coal Age*, March, 1941, p. 115), featured, according to the company, by perfect circle throw over the entire screen surface, high efficiency, low cost and reduced power consumption (60 per cent of that required by other screens of similar capacity). Available in single- and double-deck models, the screen can be suspended from cables or set on the floor.

Barber-Greene Co., Aurora, Ill.—Pictorial display of surface coal-handling, storage and barge-loading equipment.

Bethlehem Steel Co., Bethlehem, Pa.—"Mayari-R" and other corrosion- and abrasion-resisting plates for preparation plants.

Bixby-Zimmer Engineering Co., Galesburg, Ill.—Round-wire dewatering, dedusting and sizing screens in both bronze and stainless steel for shaker, vibrating or sluice applications, including new ¼-mm. screen for dewatering purposes featured by uniform slot openings for maximum accuracy in screening.

Carnegie-Illinois Steel Corporation (subsidiary United States Steel Corporation), Pittsburgh, Pa.—U.S.S. carbon-steel, silicon structural steel, abrasion-resisting steel, "Cor-Ten," "Man-Ten" and stainless-steel screens.

Central Electric Repair Co., Inc., Fairmont, W. Va.—Chute- or suspended-type tramp-iron magnets.

Centrifugal & Mechanical Industries, Inc., St. Louis, Mo.—Elmore continuous centrifugal dryer for dewatering and cleaning fine sizes of coal.

Deister Concentrator Co., Ft. Wayne, Ind. — "Diagonal Deck" coal-washing tables, including the late-type "Super-Duty" unit with "Concenco" anti-friction head motion; "Tri-Vibe"-equipped Leahy screening equipment; "Concenco" spray nozzles; and the new heavy-duty Type CRF "Concenco" revolving feed distributor (Fig. 33). Developed for efficiently feeding a series of jigs or coal-washing tables, this latter unit will divide a primary stream of raw coal up to 1¼ in. in size into any number of uniform splits from two to six. The feeder is equipped with anti-friction bearings and is driven through a special coaster-clutch coupling by a ½-hp. gear-head motor.

Deister Machine Co., Ft. Wayne, Ind.—Pictorial display of Deister "Plat-O" coal-washing tables plus a 4x8-ft. double-deck "Plat-O" vibrating screen.

Differential Steel Car Co., Findlay, Ohio—Photo display of three-way-dumping refuse-disposal larries.

Fairmont Machinery Co., Fairmont, W. Va.—Fairmont preparation equipment and services.

Hendrick Mfg. Co., Carbondale, Pa.—Perforated-metal screens for coal preparation, including flanged lip screens and stainless-steel dewatering screens; also the new Hendrick screens for sizing and dewatering (Fig. 34), described as flat units with both shaking and whipping actions and adaptable to use where the headroom is limited.

Illinois State Geological Survey, Urbana, Ill.—Illinois coal resources; research work on coal; manufacture of briquets and improvement of stoker coals, etc.

Jeffrey Mfg. Co., Columbus, Ohio—Jeffrey chain, drag and belt conveying equipment for coal handling and preparation, including the "Mass-Flo" conveyor; slow-speed "Flextooth" crushing equipment; Jeffrey unit washer; Jeffrey-Traylor electric vibrating "Conveyan-screen" and feeders; Jeffrey piano-wire screen cloth; Jeffrey 240-A capstan car puller; pictorial display of Jeffrey Baum-type and diaphragm jigs, etc.

Johnson-March Corporation, New York—"Coaladd" chemical compound for permanent dustless treatment of coal.

Kensingston Steel Co., Chicago—"Oro" manganese-steel apron feeders.

Link-Belt Co., Chicago—Link-Belt conveying, elevating and coal-handling equipment; Link-Belt air-pulsated coal washers; "Roto-Louvre" coal dryers; crushing and screening equipment; other tipple and preparation equipment; Link-Belt automatic stokers for industrial and residential use; and coal and ash-handling equipment for power plants. Among the conveying-equipment items was the new Link-Belt rubber-tread impact-carrying idler (Fig. 35) for use at points where belt conveyors are loaded; also

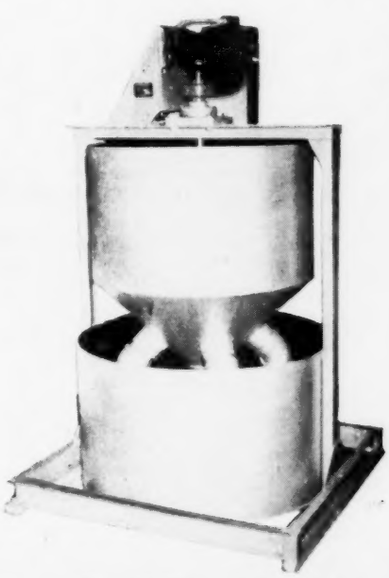


Fig. 33—"Concenco" revolving feed distributor.

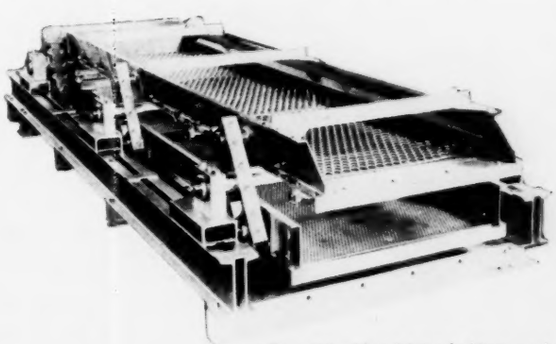
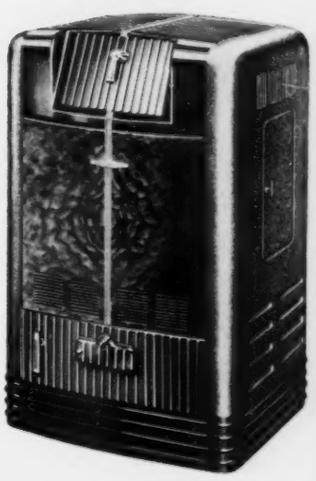


Fig. 34—Hendrick shaking and whipping screen

Fig. 35—Link-Belt rubber-tread impact-carrying and return idlers.

Fig. 36—Locke "Warm Morning" cabinet heater.



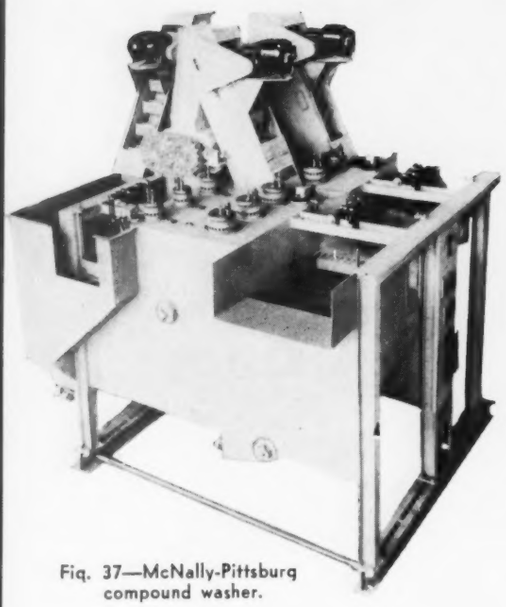


Fig. 37—McNally-Pittsburg compound washer.

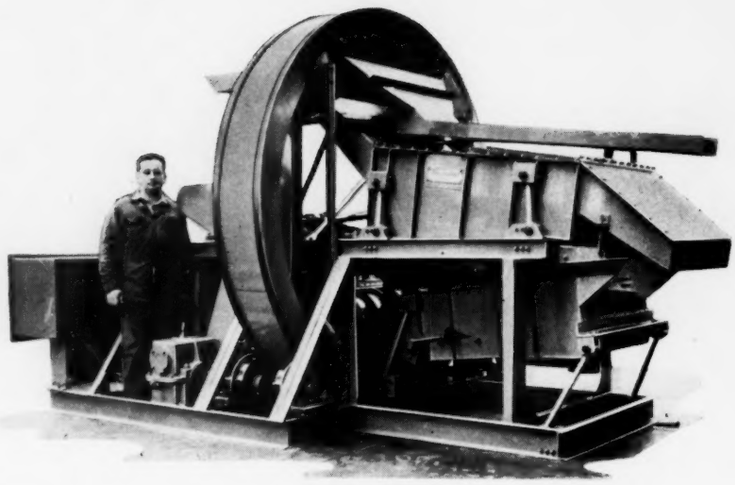


Fig. 38—Stephens-Adamson fine-coal dry cleaner.

the rubber-tread return idler (Fig. 35), which provides a kneading action to free the return run of the belt from sticky material.

Locke Stove Co., Kansas City, Mo.—Locke "Warm Morning" heaters, including the new cabinet model (Fig. 36) holding 100 lb. of coal, or sufficient for a full day's operation under normal conditions. Provision is made for circulation of air at almost any temperature desired by adjustment of the drafts. Adjustable heat vents on the sides release large volumes of warm air for fast warm-ups. An automatic damper and humidifier pan are provided as standard equipment.

McLanahan & Stone Corporation, Hollidaysburg, Pa.—From its line of crushing equipment, showed an 18x24 all-steel automatic "Steel-Strut" quick-adjustment "Black-Diamond" crusher; also featured the new "Bantam Buster," a low-cost unit for small properties interested in increasing stoker-coal output. It will produce stoker coal from mine-run, according to the company, and can be adjusted quickly so as to provide any size of product from ¾ to 4 in.

McNally-Pittsburg Mfg. Corporation, Chicago—Photographic and diagrammatic display of various McNally-Pittsburg preparation aids and services, such as crushers and stoker-coal sizers, McNally-Norton automatic washers, McNally-Rheo coarse-coal launders, Menzies cone separators, McNally-Carpenter centrifugal dryers, McNally-Vissac thermal dryers, Battelle fine-coal launders, etc., supplemented by a new McNally-Norton compound washer (Fig. 37). Designed primarily for use in recovering coal from middlings cheaply and effectively, the new unit consists essentially of two washers and a middlings crusher combined in one machine. Capacities range from 100 to 350 tons per hour.

In the field of stoker-coal sizing, McNally-Pittsburg offered a new reversible ratchet adjustment which is standard equipment on all 24- and 36-in. stoker-coal crushers. The ratchet adjustment is applied to one of the adjustment screws, which is connected with the adjustment screw on the opposite end by sprockets and a roller chain. An indicator shows the exact distance of roll movement. Adjustments may be made in a few seconds even while the crusher is in operation.

Nordberg Mfg. Co., Milwaukee, Wis.—Symons horizontal vibrating screens.

Productive Equipment Corporation, Chicago—"Selectro" vibrating screens for dewatering and coal-sizing services.

Roberts & Schaefer Co., Chicago—One of three Stump "Air-Flow" coal cleaners for Island Creek No. 20 mine, featured by a divided box with individual air controls on each side for better adjustment of operating results; also a pictorial presentation of other Roberts & Schaefer preparation equipment and services, with emphasis on the "Hydrotator" cleaner for bituminous coal.

Robins Conveying Belt Co., Passaic, N. J.—Pictorial presentation of Robins preparation equipment and Robins-built plants; models of Robins "Gyrex" and "Vibrex" screens; Robins improved troughing and return idlers, "Rubberdisc" return idlers, and troughing and return belt trainers. Completely redesigned for greater strength and rigidity, longer life with less maintenance, and reduced belt wear, the improved troughing and return idlers are featudred by a "One-Shot" lubricating system.

John A. Roebling's Sons Co., Trenton, N. J.—Screen cloths for coal sizing and dewatering.

Simplicity Engineering Co., Durand, Mich.—"Simplicity" gyrating coal screens in both the inclined and horizontal types.

Standard Oil Co. (Indiana), Chicago—Spray oils for dustproofing coal.

Stephens-Adamson Mfg. Co., Aurora, Ill.—Stephens-Adamson fine-coal cleaner for dry-cleaning 3/8x0-in. coal. Similar to the "Air-Sand" cleaner, the fine-coal cleaner (Fig. 38) has a capacity of 30 to 50 tons per hour in a 3-ft. separator. It is extremely compact—approximately 15x9x8 ft.—and is shipped from the factory completely erected so that it is necessary only to transfer the unit from the freight car to the foundation. The complete machine weighs less than 3 tons and is powered by a 15-hp. motor.

Sun Oil Co., Philadelphia, Pa.—"Coalkotes" for dustproofing coal.

Tamping Bag Co., Mt. Vernon, Ill.—New spray nozzle with slotted orifice providing a fan-shaped spray for good coverage with a very small opening; used for oil, chemical, etc., sprays, including dustproofing of coal.

W. S. Tyler Co., Cleveland, Ohio—Tyler screen cloths, Tyler 400 electric vibrating screens, "Ty-Rock" rubber-cushioned low-angle vibrating screens.

United Engineers & Constructors, Inc., Philadelphia, Pa.—The Chance sand-flotation process for cleaning bituminous coal.

United States Rubber Co., New York—U. S. "Royal" conveyor belts.

West Virginia Geological and Economic Survey, Morgantown, W. Va.—West Virginia coals and coal fields.

Safety and Health Promotion Mine Ventilation

Air Hygiene Foundation, Pittsburgh, Pa.—Prevention of illness and occupational disease through research and assistance to member organizations.

American Brattice Cloth Corporation, Warsaw, Ind.—Powder bags, brattice cloth, "Mine-Vent" ventilating tubing in various grades and with various types of suspensions, and "Mine-Vent" tubing couplers.

Bemis Bros. Bag Co., St. Louis, Mo.—"Flexipipe" ventilating tubing with rope-seam suspension.

Brown-Fayro Co., Johnstown, Pa.—"Brownie" BC tubing blower with totally inclosed non-overloading motor.

E. I. du Pont de Nemours & Co., Inc., Fairfield, Conn.—"Ventube" system of auxiliary mine ventilation.

John Flocker & Co., Pittsburgh, Pa.—"Moropa" cotton brattice cloth, made of American materials and described as flameproof, highly resistant to fungus, mildew and abrasion and 38 per cent more effective in retaining air.

Jeffrey Mfg. Co., Columbus, Ohio—Type 8H-60 "Aerodyne" fan with adjustable blades; "Aerodyne Midget" tubing blowers.

Johnson-March Corporation, New York—Control of coal dust in the mine and on the surface by the new Compound "M," described as a "powerful chemical concentrate which, when added in very small quantities to water, will cause it to penetrate and allay coal and silica dust by producing quick dispersion of the liquid over the coal particle." Compound "M" is added at the rate of 1 gal. per 1,000 gal. of water, and the company states that effective dust control can be had in the mine at approximately ½c. per ton.

Where tanks supply water to cutting machines and the like, the compound is added to the tank, where it mixes automatically. If the mine is piped, automatic proportioning feeders have been designed to introduce the compound in the correct proportions. Compound "M" is stated to be effective with any kind of mine water and greatly reduces the quantity which must be applied for dust control. It is "non-toxic, non-inflammable, has no odor and is not injurious in any way to the workmen." Benefits cited by the maker include: "decrease in explosion hazard; healthier working conditions; increased efficiency of workers; decrease in accidents due to better visibility; and reduction in the rate of deterioration of rock-dust effectiveness."

La-Del Conveyor & Mfg. Co., New Philadelphia, Ohio—La-Del-Troller fans and room blowers, including a new portable blower weighing 85 lb. complete with motor and starter.

Mine Safety Appliances Co., Pittsburgh, Pa.—Featured the M-S-A self-rescuer. Other M-S-A safety and health products shown: Burrell all-service masks, including a type with Kops telephone headpiece operating without the use of batteries; various types of oxygen apparatus; carbon-monoxide detectors; methane detectors, indicators and alarms in both portable and permanent types; safety shotfiring units and Bakelite explosives carriers; trolley guards; rubber-tired and skid-mounted portable rock-dusting machines; car stops; Foille spray kits for burn treatment; first-aid kits, including a new unit containing the revised list of materials specified in the 1940 Bureau of Mines First-Aid Manual; safety shoes, safety hats and other protective clothing; goggles and welders' masks; safety harnesses of various types, with new tail lines for safety belts in both plain and rubber-covered types with the hooks swaged on; H-H inhalators; "Ear-Defenders"; "Rheoderm" apparatus for curing athlete's foot; "accident" clocks; dust-counting and determination equipment; the Model P Edison electric cap lamp; and Edison hand lamps.

Respirators included the "Comfo" and "Dustfoe," both of which may be fitted with plastic eyeshields (Fig. 39). These eyeshields, which can be removed and replaced, are designed to deflect small flying particles and afford full unobstructed vision. M-S-A also offered safety headgear with similar plastic eyeshields which are fastened under the visor and snap down to protect the eyes.

Goggles and safety glasses took in the new American Optical Co. "On-Center" safety goggle of the spectacle type, which also may be fitted with wire-mesh side shields. Among the features of this goggle (Fig. 40) are a double-braced bridge, a design that conforms to the orbit of the eye; comfortable rocking pads, insulated heat-resisting perspiration-proof temples and three eye and bridge sizes.

Portable Lamp & Equipment Co., Pittsburgh, Pa.—Portable electric cap lamps and self-service automatic charging equipment; "Cool-Caps" and other safety and first-aid equipment.

Safety First Supply Co., Pittsburgh, Pa.—Willson safety goggles and respirators. E. & J. resuscitators; other safety and first-aid equipment.

U. S. Bureau of Mines, Washington, D. C.—Prevention of coal-mine explosions by adequate ventilation, rock-dusting, wetting to allay dust, use of permissible equipment and adequate supervision.

Wheat Lamp Sales, Inc., Charleston, W. Va.—Wheat electric cap lamps and Wheat self-service automatic charging systems; Wheat hand lamps, including a new and more powerful portable spotlight; Koehler flame safety lamps; pouch-type battery belts; and Bullard "Tufnut" safety hats with snap-in band to permit converting hat from summer to winter use and vice versa. A feature of the exhibit was the new Wheat Model M cap lamp stated to have a 15-per-cent higher light output with only a 10-oz. increase in battery weight. Balsa-wood separators in the battery reduce loose liquid to practically zero and a new type non-spill vent further reduces the possibility of liquid escape. A new convenient pistol-type watering device facilitates filling. The charging system, according to the company, insures a positive contact and consequently a full charge. Also displayed was a new bench-mounted electro-magnet for Koehler flame safety lamps, described as small in size and very powerful.

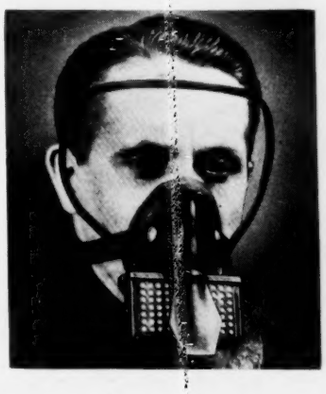


Fig. 39—M-S-A "Dustfoe" respirator with plastic eyeshield.

Fig. 40—American Optical Co. "On-Center" safety goggles.

Motors and Power Equipment For Mechanical Mining

Louis Allis Co., Milwaukee, Wis.—Standard squirrel-cage and open-type d.c. motors, protected-type d.c. motors; and special dust-, explosion- and splash-proof motors (a.c. and d.c.) for underground and surface applications.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.—Ball-bearing totally inclosed and adjustable sleeve-bearing motors.

American Steel & Wire Co. (subsidiary United States Steel Corporation), Cleveland, Ohio.—Wire application and service problems and their solution: "Amerclad," "Amerbestos," parkway and building wires and cables, magnet wire and other wires and cables, including borehole types; also rail bonds of all types for power and signal work. A featured exhibit was Type PS semi-conducting shielding, described as an improved method of shielding power cables by the use of semi-conducting layers and conducting rubber. This shielding may be used in combination with ground wires or other metallic shielding, and is said to completely eliminate corona.

Anaconda Wire & Cable Corporation, New York—Anaconda borehole suspension units; "Securityflex," "Duracord," "Durasheath" and other cords and cables; telephone wire; magnet wire, etc.; also a new "Securityflex" two-conductor parallel-duplex mining cable with a third ground wire to meet late requirements for mechanical-mining work.

Bowdil Co., Canton, Ohio—Bryant "Choke Arc" locomotive transfer switches.

Thomas A. Edison, Inc., West Orange, N. J.—One of several types of Edison nickel-iron-alkaline shuttle-car batteries with the cells in separate units so that trays can be slipped out of the case as required; other Edison batteries; and the new Edison hand lamp in the 2- and 3-cell types using cap-lamp-type headpiece with four reflectors for various diffused and spotlight services.

Electric Railway Equipment Co., Cincinnati, Ohio—"Elreco" trolley and overhead line materials; steel-base quick-break switches; heavy-duty section insulators, etc.; also a new fused gate-end, or junction, box. The case of the box (Fig. 43) forms part of the safety ground and thus this ground must be carried at all times. Cable joints are made by connectors which can be put together only one way, thus preventing mistakes in connecting up. The box is made with an internal contactor which acts through a pilot circuit to open a breaker back in fresh air when any attempt is made to open the box. Since the contactor may be of the permissible type, the company states that there is no chance of making an arc toward the face. Weight of the box is 46 lb., and it is designed for low coal. It may be used in connection with connector boxes (Fig. 43), also arranged with contactors so that the breaker is opened through the pilot circuit as soon as the lid is raised.

A new open-type junction box with the switch interlocked with the lid was another "Elreco" item (Fig. 42). The return and safety ground are carried through the steel case, inside of which are standard fuses and cable connectors, the latter arranged so that they cannot be put together wrongly. All parts in the case, in fact, must be in their proper places before current will flow, and nothing can be put inside the case to short it out. Chain-type strain relievers are attached to the outside.

Electric Railway Improvement Co., Cleveland, Ohio—"Erico" rail bonds of all types; welding apparatus and accessories.

Electric Storage Battery Co., Philadelphia, Pa.—"Exide-Ironclad" cells and storage batteries, including the Type ME assembled in a hard-rubber container for locomotive service; also "Exide-Ironclad" shuttle-car batteries.

Flood City Brass & Electric Co., Johnstown, Pa.—Complete line of overhead line material, trolley wheels and harps, government-approved d.c. motor starters, automatic locomotive transfer switches, etc.

General Electric Co., Schenectady, N. Y.—Featured the new G.E. "Tri-Clad" motors (*Coal Age*, December, 1940, p. 119), described as more streamlined, more completely protected through the use of a cast-steel frame and incorporating major insulation advances, improved bearing design and better lubricating arrangements. G. E. also displayed tellurium high- and low-voltage cables, heavy-duty Class BM d.c. motors, air circuit breakers, heavy-duty mine-type starters, drip-proof protected heavy-duty mine-type d.c. motors, etc., and used photos and diagrams to present synchronous converters, motor-generator sets and power rectifiers.

Goodman Mfg. Co., Chicago—Conveyor-control panels.

Gould Storage Battery Corporation,

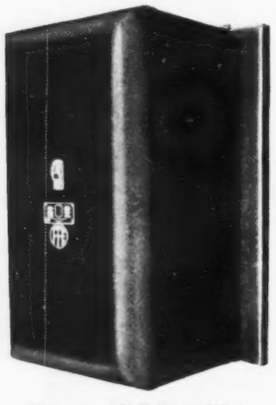


Fig. 41—I-T-E Type KBA breaker.

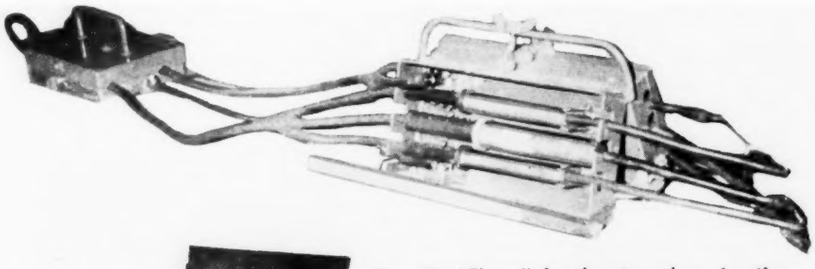


Fig. 43—"Elreco" fused gate-end, or junction, box with cable connector box.

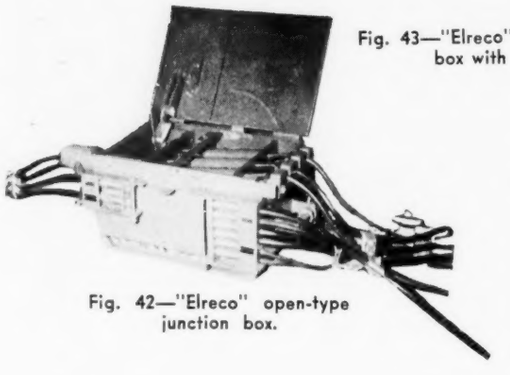


Fig. 42—"Elreco" open-type junction box.

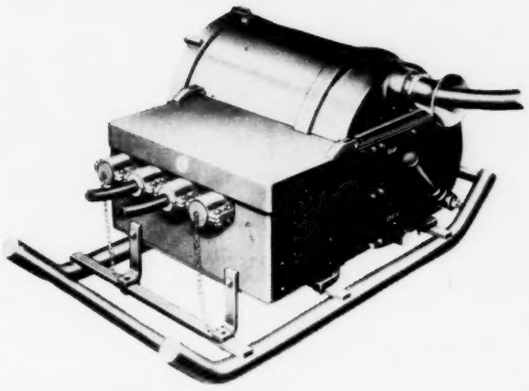


Fig. 44—O-B Type GM gasproof fused multiple distribution box.

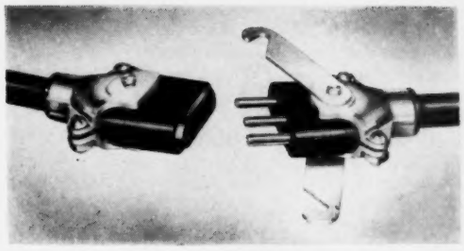


Fig. 45—O-B 80-amp. "Mechano-Plug."

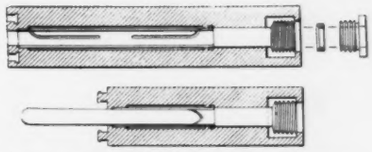


Fig. 46—"Safeway" single-conductor cable connector.

Depew, N. Y.—Gould "Kathanode-Glasklad" shuttle-car batteries; other "Kathanode-Glasklad" locomotive batteries.

I-T-E Circuit Breaker Co., Philadelphia, Pa.—Relays for special protection of mining substations; I-T-E load distributor; refined Type KSC automatic reclosing circuit breaker for use on substation tie feeders or large mine distribution systems; redesigned Type KSA breaker for semi- and full-automatic substations with new arcing structure (new style arc chute with baffles for longer life and trouble-free operation; Type ETB circuit breaker for protecting trolley-wire feeders from high-resistance grounds; and the new Type KBA breaker for stub-end circuits and protection of the machinery and feeders of individual mechanized sections. The KBA breaker (Fig. 41) is of the one-pole type, 600 volts or less, 300 and 600 amp. Over-all dimensions with the cover on are: width, 20 in. and height, 31 in., making it suitable for low coal.

Jeffrey Mfg. Co., Columbus, Ohio—Unit conveyor controls.

Mine Safety Appliances Co., Pittsburgh, Pa.—M-S-A "Velocity-Power" cable splicers, using blank cartridges for the splicing operation.

Mines Equipment Co., St. Louis, Mo.—Miller cable connectors, Miller rubber-cable vulcanizers, and the new Miller "Biguns," or coupling-type taper-pin cable connectors. These connectors, according to the company, are adaptable to connecting cables with one to seven or more conductors and are proof against water leakage. Taper-pin coupling makes it impossible to pull "Biguns" apart accidentally, it is asserted, and provision is made for positive locking. Other company products were "String-A-Lite" portable lighting systems and "Toolines," or portable power-distribution systems.

National Carbon Co., Inc., Carbon Sales Division, Cleveland, Ohio—Electric motor brushes and other carbon products.

National Electric Coil Co., Columbus, Ohio—Engineered coil service.

Ohio Brass Co., Mansfield, Ohio—Featured the protective and control devices developed by Ohio Brass especially for the electrical needs of mechanized mining; also complete line of bonds and bonding equipment, trolley taps and ground clamps, current collectors of all types and overhead trolley and feeder materials, including new smooth-underrun sectionalizing feeder switches, frogs, splicers, etc.

The protective scheme for mechanized mining based on the use of open-type equipment featured O-B safety switches, fused trolley taps, "Mechano-Plugs," fused junction boxes (designed so that cables cannot be wrongly connected), and automatic motor starters, with protection. Among the "Mechano-Plugs" was a new 80-amp. unit (Fig. 45) for 3-conductor trailing cables, No. 6 or smaller wires. The new plug is flat and can be installed on the cable ends in the field without special tools or equipment. A double locking arrangement prevents the halves from being pulled apart accidentally. Non-corrosive plugs are arranged to prevent improper polarity in making connections. All joints are dust- and moisture-proof and the rubber body protects man and device from the possibility of electrical shock or mechanical strain and impact.

For gaseous operations, the O-B system was based on the use of O-B circuit breakers (out on fresh air), Type ADG gasproof automatic motor starters and the new Type GM gasproof fused multiple distribution boxes (Fig. 44). The GM box consists of a gastight compartment containing a double-pole disconnect switch and fuse panel, and a plug compartment containing four 3-conductor rubber plugs. The lid of the plug compartment and the screw cover of the gastight compartment are interlocked with the switch so that it is impossible to remove a plug or change a fuse with the power on. The GM box, according to the company, provides a safe and convenient means of serving conveyors, blowers, drills, hoists and cutting and loading machines. "It also provides positive overload protection for each of the four circuits." One plug circuit is arranged for a 300-amp. fuse, two for 60-amp. fuses and one for a 30-amp. fuse. Over-all height is 18½ in.; length, 41½ in.; width, 25 in.

Ohio Carbon Co., Cleveland, Ohio—Carbon, graphite and metal brushes for motors, generators and other brush-bearing equipment.

Owens-Corning Fiberglas Corporation, Toledo, Ohio—"Fiberglas" insulation for mine equipment.

Penn Machine Co., Johnstown, Pa.—"Everlast Super-Weld" reversible rail bond, which can be installed with terminal over or under the rail, is made by the electric flash-weld process (assuring uniformly perfect welds), cannot be damaged by the heat of the welder's arc, has higher tensile strength, lasts longer ("indestructible in normal service after proper installation"), has greater conductivity through use of soft-steel terminals, is easy to install, can be reclaimed by breaking the weld with a chisel for repeated use, and, the company also states, is more economical. Other "Super-Weld" bonds were the PM-4 and PM-5 U types, PM-10 minimum-length type and the TP-9 for temporary use.

Pennsylvania Electric Coil Corporation, Pittsburgh, Pa.—Coils for mining service,

featuring special varnishes for long life.

Philco Corporation (Storage Battery Division), Philadelphia, Pa.—Type 13XL 330-amp.-hr. shuttle-car battery; other Philco mining batteries.

Post-Glover Electric Co., Cincinnati, Ohio—P-G automatic locomotive transfer switches, steel-grid resistors and motor starters.

Reliance Electric & Engineering Co., Cleveland, Ohio—Permissible a.c. and d.c. motors for underground use; nonpermissible motor with window over commutator so can inspect easily and quickly; motor-lubrication system which assures complete greasing without overlubrication and getting grease into the motor, etc.

John A. Roebling's Sons Co., Trenton, N. J.—Roebling electrical wires and cables, coils, etc.

Rome Cable Corporation, Rome, N. Y.—Insulated wires and cables, featuring the "Rome 60" types for use in coal mines.

Tamping Bag Co., Mt. Vernon, Ill.—Daniel Woodhead Co. "Safeway" cable connectors (single-conductor type shown in Fig. 46). In both the single and multiple types, the connectors are offered in 50- to 250-amp. ratings. The metallic contact parts, it is stated, are molded into high-quality oil- and heat-resisting rubber, making them weatherproof. The female connector is made with a brass tube split to form spring contacts, one on the connecting end to receive the male connector pin and one on the cable end to receive a pin soldered to the cable. No taping or splicing is necessary to install the connectors on the cable ends, the company points out—merely remove $\frac{3}{8}$ to $\frac{1}{2}$ in. of insulation and solder into the ends of the contact pins. Both the male and female connectors are provided with stuffing boxes, making them watertight where the cables enter, and with special forced rubber joints on the opposite ends for weatherproofing the unit. Stuffing boxes may be applied to both ends to insure a waterproof joint.

United States Rubber Co., New York—U. S. "Royal" mining-machine, locomotive and power cables.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.—Overhead line materials; mining-type motors, starters and controls for conveyors, pumps, fans, etc.; a complete "Ignitron" rectifier in operation; and Westinghouse Type ASL air-cooled transformers, which, it is stated, eliminate fire, explosion and toxic-gas hazards, do not require vaults, are low in installation cost, may be located near load centers to shorten cable runs, are light in weight and thus are easy to handle, and have a low maintenance cost. For 60-cycle service at 13,200 volts or less, capacities are: single phase, 150 to 500 kva.; three phase, 150 to 1,000 kva.

Materials and Supplies for Mines Maintenance Aids

Ahlberg Bearing Co., Chicago—New cleaning and lubricating service for bearings, including Croft washer and grease packer; CJB "Master" ball bearings; Norma-Hoffmann bearings; RBC bearings; Bower tapered roller bearings; Ahlberg ground bearings.

Air Reduction Sales Co., New York—"Airco" oxygen and acetylene, "Airco" welding and cutting apparatus and supplies, "Stoody" hard-facing materials and specimens of mining machinery parts fabricated or repaired by the use of the oxyacetylene or arc-welding processes, such as 4/0 trolley wire spliced by low-temperature brazing with "Easy-Flo" and "Handy Flux," and a crusher segment (Fig. 47) on which the teeth were built up by $\frac{1}{2}$-in. "Stoody" self-hardening rod running 50 to 54 on the Rockwell C scale.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.—"Texrope" multiple V-belt constant- and variable-speed drives.

American Chain & Cable Co. (American Cable and Hazard Wire Rope divisions), Bridgeport, Conn.—"Tru-Lay" and "Lay-Set" preformed wire ropes.

American Cyanamid & Chemical Corporation, Explosives Dept., New York—"American" permissible explosives, electric blasting caps, other explosives and blasting aids.

American Steel & Wire Co. (subsidiary United States Steel Corporation), Cleveland, Ohio—"Tiger" brand wire rope and fittings; "Excellay" preformed wire rope; tramway ropes, etc.

Atlas Powder Co., Wilmington, Del.—"Manasite" detonators and the company's full line of 19 permissible powders.

Bethlehem Steel Co., Bethlehem, Pa.—Manufacture and use of wire rope.

Bowdil Co., Canton, Ohio—Bushings for mining equipment; Bowdil rope clamps and sockets.

Broderick & Bascom Rope Co., St. Louis, Mo.—"Yellow-Strand" standard and "Flex-Set" preformed wire ropes; B. & B. slings of all types.

Cardox Corporation, Chicago—"Cardox" coal-breaking method, featuring tubes, heater elements and rupturing disks for all mining conditions.

Carnegie-Illinois Steel Corporation (subsidiary United States Steel Corporation), Pittsburgh, Pa.—Steel mine timbers for all services.

Central Electric Repair Co., Fairmont, W. Va.—Field-coil tester and a new lathe-type mica undercutter (Fig. 48). The undercutter, according to the company, can be adjusted quickly to any lathe from 9- to 24-in. swing, and attaches in the same position as the tool post. Will cut to the desired depth and at the same time slightly bevel the copper bars. Uses V-type milling cutters of any desired angle or thickness from $\frac{1}{16}$ to 1 in. outer diameter with $\frac{5}{16}$-in. hole. Weight is 35 lb.

Chicago Pneumatic Tool Co., New York—Portable electric and pneumatic drills, nut runners, grinders, chipping and riveting hammers, etc., for repair and maintenance work.

Cities Service Oil Co., New York—"Trojan" lubricants and lubrication services; also the "Sealed Lubrication" system, comprising a grease-filled sealed cartridge with a grease gun of special design which prevents exposure of the lubricant until applied.

Coffing Hoist Co., Danville, Ill.—"Safety-Pull" ratchet-lever hoists, "Quick-Lift" electric hoists; and various types of spur-geared chain hoists.

Duff-Norton Mfg. Co., Pittsburgh, Pa.—Lifting and screw jacks, push-pull jacks, gear-and-pinion pullers, and a new roof and timber jack (Fig. 49). Greater strength and rigidity are cited for the new roof jack, with quicker, easier spotting under all conditions. Handles include the slide type, the new drop handle which folds down beside the standard when not in use, and the wing-nut type. Heads are made in four styles, including types to accommodate 4- or 6-in. H-beams or round or square timbers, as well as the ball-and-socket head for use directly against the roof.

E. I. duPont de Nemours & Co., Inc., Explosives Dept., Wilmington, Del.—"Lump Coal C," "Gelobel C," "Monobel C" and detonators for coal-mine use. *Grasselli Chemicals Dept.:* Chromated zinc chloride for timber treatment, with especial stress on its fire-retardant properties.

Flood City Brass & Electric Co., Johnstown, Pa.—Bushings and replacement parts for locomotives and mining machines.

Gibraltar Equipment & Mfg. Co., St. Louis, Mo.—Shop tools, including the "Gemco Tru-Blu" keyseater, lubricating equipment, etc.

Gulf Oil Corporation, Pittsburgh, Pa.—Gulf mining lubricants, including two new lines of ball- and roller-bearing greases. One, Gulf "Anti-Friction" grease, is recommended for heavy-duty service. The other, Gulf "Precision" grease, is recommended for lighter duty and higher speeds.

Haynes Stellite Co., New York—Hard-

facing applications and tipping of bits with "Stellite" and "Haystellite."

Hercules Powder Co., Inc., Wilmington, Del.—Correct selection and use of explosives for coal mining.

Hulburt Oil & Grease Co., Philadelphia, Pa.—Hulburt "Quality" greases and special greasing equipment.

Jeffrey Mfg. Co., Columbus, Ohio—Jeffrey repair parts for mining equipment; locomotive headlights, etc.

Kensington Steel Co., Chicago—"Oro" manganese-steel replacement parts for stripping equipment and preparation plants (shovel teeth, chains, rollers, sprockets, cat treads, etc.); also a new construction for a 950-B cat unit in which the width of the roller is increased from 5 to 8 in., supplemented by cat pads to fit the new rollers.

King Powder Co., Cincinnati, Ohio—"Red Crown Surface-Sensitized" permissible, offered by the company for better, firmer lump coal.

A. Leschen & Sons Rope Co., St. Louis, Mo.—"Hercules Red-Strand" wire ropes in either round or flattened-strand constructions and standard or preformed types.

Linde Air Products Co., New York, N. Y.—Welding and cutting apparatus, acetylene generators, acetylene and oxygen, and various uses of the oxyacetylene process in the coal industry; also "Union" carbide, carbide floodlights, etc.

Link-Belt Co., Chicago—Power-transmission equipment, including the "P.I.V." gear, Link-Belt speed reducers, power-transmission chains and "Friction-Fighter" ball- and roller-bearing units.

Macwhyte Co., Kenosha, Wis.—Correct ropes for mining equipment in both non-preformed and preformed types with Macwhyte internal lubrication; also Macwhyte slings and wire-rope fittings.

Markham Products Co., Birmingham, Ala.—Markham adjustable safety mine props in a range from 14 to 60 in. high, with various types of heads and safety knockout blocks for remote collapsing and removal.

Metal & Thermit Corporation, New York—Welding of shafts and castings by the "Thermit" process; "Murex" electrodes for arc-welding, building up worn parts, etc.

Mining Machine Parts, Inc., Cleveland, Ohio—Representative items from its line of "Improved" repair parts for mining equipment, including chains, flights, brake bands, sprockets, shafts, "Neoprene" oil-resistant hoses, etc., for loading machines, in addition to an improved clutch hub made of steel with hardened replaceable insert and chains with improved riveting; also "Dymonhard" hard-facing rods for all high-speed severe-duty mining operations.

Nail City Bronze Co., Wheeling, W. Va.—"Hi-Led-Loy" non-freezing bearing bronze; high-tensile acid-resisting titanium-bronze; complete line of bronze parts for mining equipment.

National Carbide Corporation, New York—"National" carbide and floodlights.

Ohio Brass Co., Mansfield, Ohio—Locomotive headlights; arc-welders.

Ohio Carbon Co., Cleveland, Ohio—"Ohio" burnisher for commutators and rings, said to be made of a special material for polishing commutators and rings without cutting, dusting or filling of the slots.

Osmose Wood Preserving Corporation of America, Inc., Buffalo, N. Y.—"Osmose" process of wood preservation designed for use on green timber.

Penn Machine Co., Johnstown, Pa.—"Quality" replacement parts for mining machinery.

Portable Lamp & Equipment Co., Pitts-

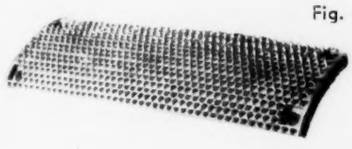


Fig. 47—Crusher segment built up with "Stoody" self-hardening rod.

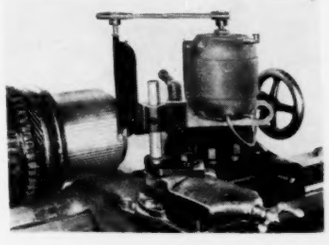


Fig. 48—Central Electric Repair Co. lathe-type mica undercutter.

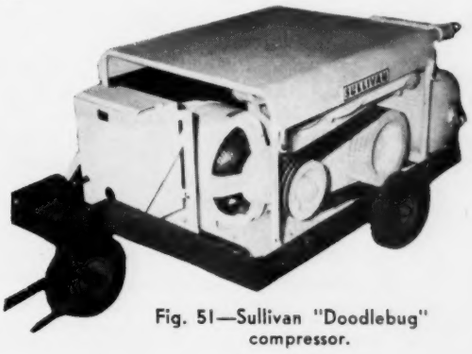


Fig. 51—Sullivan "Doodlebug" compressor.

Fig. 49—Duff-Norton roof and timber jacks.

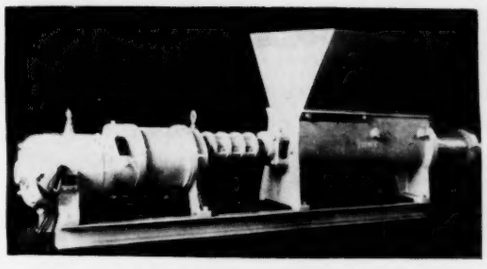


Fig. 50—Portable "Terrier" stemming mixer and extruder.

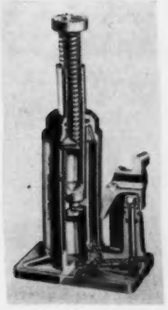


Fig. 52—"Simplex" heavy-duty hydraulic jack.

Pumps and Pipe for Coal Mines Parts and Accessories

Allis-Chalmers Mfg. Co., Milwaukee, Wis.—All-in-one "Electrifugal" motor pump (*Coal Age*, March, 1941, p. 115), latest in the company's "SS-Unit" line.

Brown-Fayro Co., Johnstown, Pa.—"Austin-Brownie" totally inclosed oil-bath-lubricated piston-type gathering pump

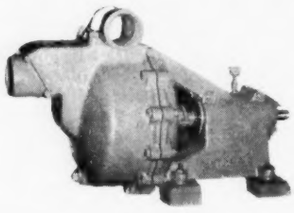


Fig. 53—Gorman-Rupp 3-in. self-priming centrifugal gathering pump.

with "Duraloy" chrome-iron water end.

Flood City Brass & Electric Co., Johnstown, Pa.—Pumps and pump parts.

Gorman-Rupp Co., Mansfield, Ohio—Centrifugal self-priming mine gathering pumps with iron, anti-acid-bronze and chromium water ends, including new larger 3-in. sizes (Fig. 53) for operation against maximum heads of 125 ft.

National Carbon Co., Carbon Sales Division, Cleveland, Ohio—"Karbate" impervious corrosion-resisting pipe and fittings and "Karbate" valves for acid mine water and other corrosive materials.

National Tube Co. (subsidiary United States Steel Corporation), Pittsburgh, Pa.—National "Duroline" pipe in plain and coated types for corrosion-resisting services, copper-steel pipe, scale-free pipe, seamless steel boiler tubes and Shelby mechanical tubing.

burgh, Pa. — "The Terrier" stemming mixer and extruder (Fig. 50). In this unit, the correct combination of sand, clay, rock dust, sandy loam or spoil needed for the shotholes is placed in the hopper for mixing. A conveyor carries the mixture to the extruder, which extrudes the stemming at 10 to 12 f.p.m. Shape or diameter of the stemming is determined by the shape or diameter of the extruder. "As extruded material is under a pressure of up to 1,000 lb., it is relieved of excess moisture, the intent being to extrude as dry as possible while maintaining cohesion. . . . As extruded, the material is broken off and packed in wood boxes. No paper wrapping is needed. . . . Experience shows that one man with the machine will produce stemming for a 3,000-ton mine in about one-half a day."

Pure Oil Co., Chicago—Lubrication of mining equipment.

Reliance Electric & Engineering Co., Cleveland, Ohio—Spare-part service for motors, including special cabinet and tags for keeping parts for particular types on hand and handy; returning of armatures, etc., for factory reconditioning was stressed.

John A. Roebling's Sons Co., Trenton, N. J.—Roebling "Blue Center" wire ropes, wire and fittings; welding electrodes and rods.

Socony-Vacuum Oil Co., Inc., New York—"Gargoyle" mining lubricants.

Standard Oil Co. (Indiana), Chicago—Mining lubricants and lubrication.

Sullivan Machinery Co., Michigan City, Ind.—The new Sullivan "Doodlebug" rubber-tired compressor (Fig. 51), designed primarily for trackless-mining service. A two-stage unit 36 in. high, the machine is rated at 105 cu.ft. of free air per minute.

Sun Oil Co., Philadelphia, Pa.—Lubricants for coal-mining applications.

W. O. & M. W. Talcott, Inc., Providence, R. I.—Featured the "Acme" patch fastener for repairing conveyor belts; also fasteners for all conveyor, elevator and transmission belting.

Tamping Bag Co., Mt. Vernon, Ill.—"Seal-Tite" tamping bags; "Seal-Tite" vibrating dummy maker; and a new welding-electrode holder described as having a special composition jaw highly resistant to sparks and burning, with plenty of air circulation for cool handling and operation.

Templeton, Kenly & Co., Chicago—Complete line of "Simplex" jacks and tools, including 5- to 35-ton lever jacks for mine and shop service; the new M8 8-ton and M16 16-ton roof jacks for mechanical mining; lever- and screw-type timber jacks, including the new No. 366, which tightens against the roof and bottom; journal, wire-tensioning, push-and-pull, ball-bearing screw and anchor, or hold-down, jacks; and the new line of "Simplex" heavy-duty hydraulic jacks (Fig. 52).

Tide Water Associated Oil Co., New York—"Tycol Green-Cast" greases; other mining lubricants.

Timken Roller Bearing Co., Canton, Ohio—Timken tapered roller bearings for mine cars and other mining machinery.

Tool Steel Gear & Pinion Co., Cincinnati, Ohio—"Tool Steel" hardened gears, pinions and replacement parts.

Trabon Engineering Corporation, Cleveland, Ohio—Trabon ½-hp. hydraulically operated barrel pumps for handling fluid, semi-solid and fibrous lubricants; other Trabon lubricating equipment and the Trabon "Positive" centralized lubrication system for mines and industrial plants. The centralized system uses a single line with Trabon "feeders" for lubricating the individual bearings. As each feeder operates, the pressure on the lubricant causes the next in series to operate until eventually the flow returns to the lubricator and operates an indicator piston to show that lubrication is completed. In case any one feeder fails to operate, an indication of complete lubrication cannot be obtained. Pumping to a predetermined pressure is not required.

Union Wire Rope Corporation, Kansas City, Mo.—Wire ropes for mine and stripping services, including individually wrapped "Tuffy" mining-machine ropes in all diameters and constructions.

Western Cartridge Co., East Alton, Ill.—Complete line of Western blasting caps and detonators.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.—Repair parts for motors and controls.

Wilson Welder & Metals Co., Inc., New York—"Wasps" and "Hornet" electric arc-welding machines, welding electrodes and accessories.

Wood Preserving Corporation, Pittsburgh, Pa.—Pressure treatment of ties, timber and other wood products.

Do You Want More Detailed Information?

If you desire additional information on any of the equipment described in this section, the manufacturers will be glad to supply you with it. Or, if you prefer, you may fill out the coupon below and mail it to COAL AGE. Happy to serve you.

COAL AGE
330 West 42d St.
New York City

Please see that I am furnished without obligation, additional information on the products listed below:

Product — *Manufacturer*

Your Name ..... Title .....

Company ..... Address .....

ANTHRACITE AT LEHIGH

Seeks to Revive Industrial Markets That Will Relieve Its Glut of Large Sizes

NOTHING moved the Fourth Annual Anthracite Conference of Lehigh University, May 8-9, meeting at Lehigh University, Bethlehem, Pa., more than the declaration of Harold J. Rose, senior anthracite fellow, Mellon Institute of Industrial Research, Pittsburgh, Pa., that the iron industry was facing a severe shortage of coke that probably would compel the use of anthracite and that this shortage had already made some of the blast furnaces use anthracite and, in at least one case, with excellent results. Anthracite, he said, used to be the standard fuel for that purpose but now is no longer used, so the word that goes from mouth to mouth is that it was not found as desirable as coke, which accordingly took its place.

Anthracite in Blast Furnace

It is natural for people to think there must have been a reason other than price. Dr. Rose said he had delivered an address before the Eastern States Blast Furnace and Coke Oven Association, Feb. 14 of this year, at Pittsburgh, and got little but smiles when he advocated the introduction into the furnace charge of anthracite increments of 5 per cent. Two men with experience in the use of anthracite for that purpose told him, after his address was completed, that with 1941 conditions, anthracite was not as good as coke, but one of these has since written him a recantation and told him that he had been compelled by a drastic shortage to use as fuel a charge of 48 per cent anthracite and 52 per cent somewhat inferior coke, and to his surprise he had obtained excellent results. Dire necessity is giving the anthracite region opportunity to prove its case—a "break" that otherwise might not have been duplicated in a century, if even then.

History of blast-furnace practice gives no indication of the excellence or undesirability of anthracite for this purpose, for steamboat sizes of anthracite formerly were used and "one-man-size" pieces of limestone, and present-day practice, furnace height, temperatures and capacities are different from those of earlier years. What the coal industry has been needing has been a market for its major sizes, and a revival of the use of anthracite in blast furnaces would meet that need.

For over 300 years, the anthracite region can continue to operate on its present reserves, provided production stays at its present levels throughout that time, declared W. M. Myers, assistant professor, mineral economics and technology, Pennsylvania State College, at the first session of the conference, with Paul B. Eaton, professor, mechanical engineering, Lafayette College, in the chair. In discussion, W. H. Lesser, mechanical and electrical engineer, Pierce Management, Inc., Scranton, Pa., wanted to know why this estimate differed so widely from that of Dr. George H. Ashley, state geologist of Pennsylvania, who put the life of the anthracite field at about 150 years (*Coal Age*, June 1938, p. 72).

"My figure," responded Dr. Ashley, "was based on the average production for 15 years, including the year 1920 and several other succeeding years of far larger production than today and, as the output was then so high, the life of the coal field at that time was being more rapidly brought toward a close than it is today."

Said Professor Myers, 1937 has been taken as a representative year.

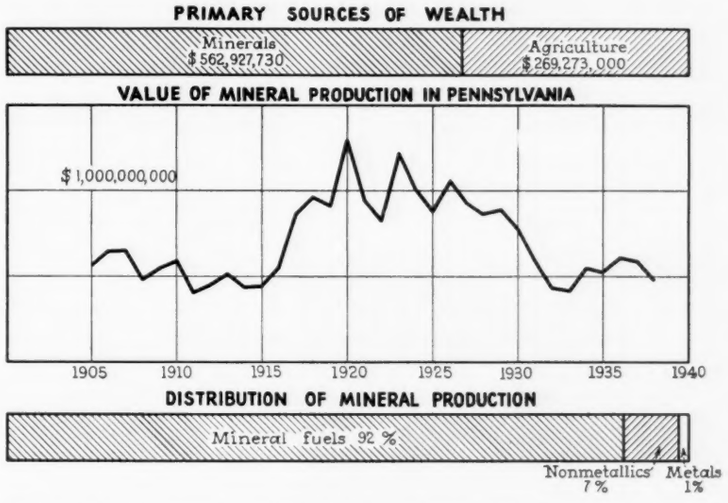
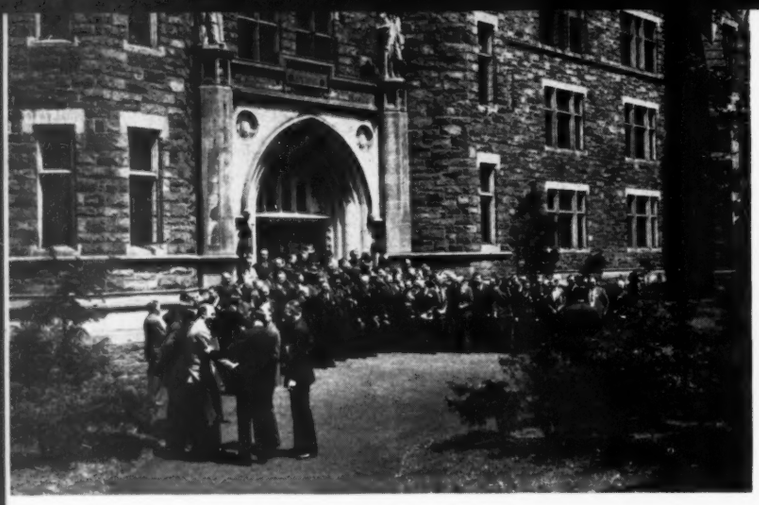


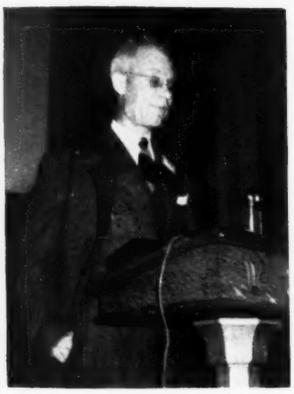
Fig. 1—Value of mineral production in Pennsylvania, 1937 (post-depression and pre-war year).



Attendants at opening session gather in front of Packard Hall before lunch in the Armory

H. M. Smyth, president and general manager, St. Clair Coal Co.; A. C. Dodson, president, Weston Dodson & Co., and Cadwallader Evans Jr., vice president and general manager, Hudson Coal Co., enjoy a get-together.

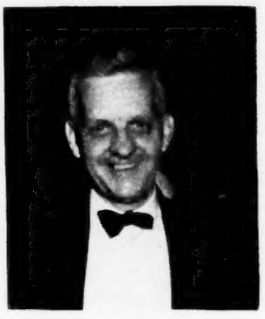
C. C. Wright, associate professor of fuel technology, Pennsylvania State College, describes anthracite in water-gas manufacture.



Joseph K. Goundie, Fritch Coal Co., urges: Buyers want comfort, and stokers should be big enough to afford it.

J. H. Kerrick, sales engineer, Philadelphia & Reading Coal & Iron Co., announces Anthracite Industries technical board.

Dr. R. S. Kopp, director of research, Air Control Corporation, insists that an attitude of defeatism must and can be overcome.

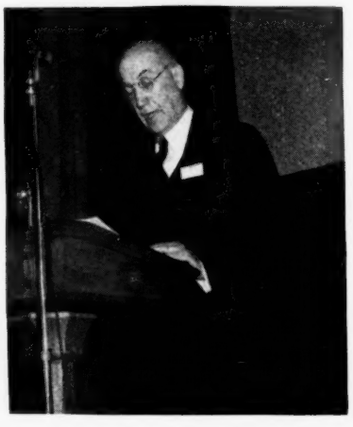


Edward C. Weichel, assistant general manager, and K. Hughes, superintendent, Marvin Colliery, Hudson Coal Co., talk shop.

F. E. Kudlich (center), engineer for Cox Estates, fraternizes with Pennsylvania Power & Light Co. representatives George Perley, power sales engineer, Wilkes-Barre; John West, technical supervisor, Allentown; F. C. Mueller, division manager, Wilkes-Barre, and J. Henry Jacobs, sales supervisor, Allentown.

R. D. Forbes, senior forester, U. S. Department of Forestry, Philadelphia; Dr. R. C. Johnson and Dr. Harold J. Rose, fellows, Mellon Institute of Industrial Research, discuss new developments.

E. G. Bailey, president, Babcock & Wilcox Co., wields the gavel at the third session.



showing substantial recovery from the "lows" of the depression yet being comparatively untouched by the stimulation of war. Mineral production of Pennsylvania from 1905 to 1915 had an average value of one half billion dollars and then, under the impetus of war and the subsequent prosperity of the twenties, it maintained from 1917 to 1929 an average level of just below a billion dollars a year. Since 1929, production has declined and shown a tendency to stabilize slightly above the 1905 level of one-half billion dollars.

On the eastern end of the new Pennsylvania Turnpike, which is 162 miles long, said Edgar O. Marty, chief mechanical and electrical engineer, Pennsylvania Turnpike Commission, Harrisburg, Pa., are six tunnel portal buildings, nine interchange ticket offices and two maintenance buildings, all using anthracite—some pea and some rice. Economy, the opportunity to demonstrate the efficacy and convenience of automatic equipment for burning solid fuels, and the employment involved in the production of coal caused that fuel to be used in preference to other fuels—anthracite on the eastern end of the turnpike, bituminous on the western.

Control of heat in the portal buildings has to be dependably automatic, for one of the two stations in each tunnel has no station personnel and must therefore be self-controlled. The furnace ashes spill over into pits of such capacity that ashes need be removed only four to five times per season and bin-feed equipment provides shovel-less firing, drawing its supply from a coal bin holding about 12 tons. Both anthracite and bituminous coal have been burned automatically in the stations of the turnpike and have furnished heat reliably and economically, but anthracite has required less attention than bituminous and demonstrated a greater ability to hold heat.

Basic carbonate white lead is made, declared E. D. Turnbull, chemical engineer, Euston Lead Co., Scranton, Pa., by melting pure lead and running it into water to produce feathered lead. Oxidation by air produces a film of lead oxide, which when dissolved by a solution of normal lead acetate produces a basic lead acetate. Purified flue gas from a coal furnace provides the carbon dioxide needed to form white lead (lead carbonate). This gas is made by so burning anthracite as to produce a high percentage of carbon dioxide. Thus, gray metallic lead and black coal together produce chemically an extremely white pigment.

Rate of reaction between lead and gas depends on percentage of carbon dioxide present. Anthracite is used because of its high-carbon content, low-volatile and sulphur percentages, and, in its combustion, the absence of tar and soot. Its uniformity and control of operation also favor its use. Sulphur products (sulphur dioxide or trioxide and hydrogen sulphide) have to be removed, so the low-sulphur content of anthracite makes it highly desirable. An effort is made to produce a carbon-dioxide content of 14 to 15 per cent, but skill is needed, and air introduced when hand firing will lower the percentage.

Sulphur dioxide or trioxide are easily removed by washing the flue gas with water in a tower packed with limestone, but hydrogen sulphide cannot thus be eliminated. However, this gas, which stains the white lead by forming a brown lead sulphide, can be burned slowly and at a high temperature to an oxide and water. In an effort to burn the sulphide, a long arch was installed over the fire in the furnace, but the quantity of sulphide only increased. Forced draft with induced stack draft also failed to burn the sulphide.

Finally, cutting down the draft openings into the ashpit under the grate, so that a definite whistling suction was established, lessened, but did not prevent, the formation of hydric sulphide. Eventually, a horizontal tubular boiler was introduced to increase capacity, and then a chain-grate stoker and tubular boiler were installed and suction under the grates was provided. High carbon-dioxide content resulted with no hydrogen sulphide. Pressure over the fire causes reducing reactions that convert the sulphur oxides to hydrogen sulphide, and with induced stack draft this pressure cannot exist.

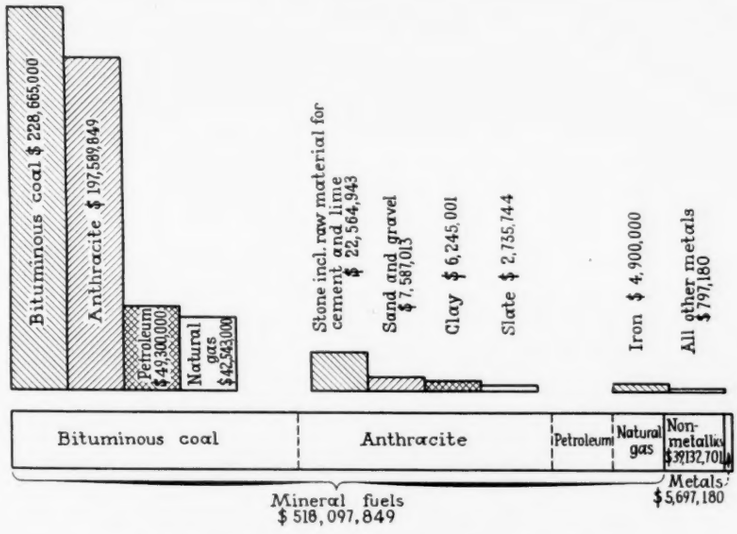


Fig. 2—Breakdown of mineral-raw-material production, 1937.

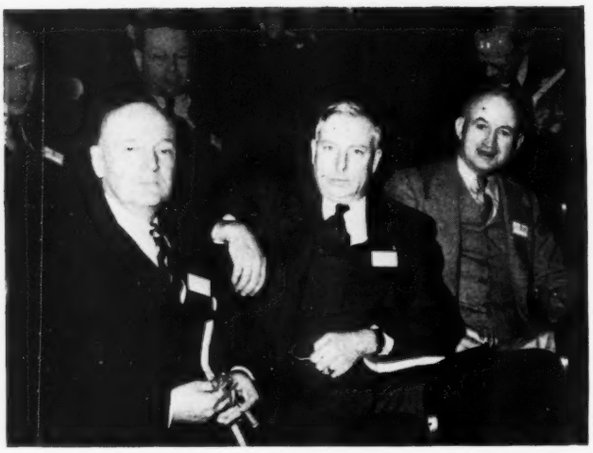
Stoker Must Fit Home

Stoker dealers should sell home owners only stokers suitable to the building they are intended to heat, commented Joseph K. Goundie, Fritch Coal Co., Bethlehem, Pa., at the second session of the conference, with T. G. Foulkes, assistant engineer of tests, Bethlehem Steel Co., in the chair. They cannot "get away with" having sold an undersized stoker by reminding the owner he is saving money when he heats his house only to 68 deg. F., when he really wants 75 deg.

A complete service for coal stokers must be provided, or the sale of such equipment will be greatly hindered. How many would have automobiles today if they themselves had to repair, grease and oil their cars? That would definitely take away the joy of such ownership.

"We try to give a little something extra in the way of service—and we charge 25c. more per ton than any other dealer in town," asserted Carl A. Fraser, Carl A. Fraser, Inc., Albany, N. Y. Among the services is a careful rescreening of the coal at the yard to remove oversize and to eliminate foreign objects, both of which may destroy automatic stokers. Most of these objectionable materials do not come from the mines. Service means also advice in handling the furnace so as, in hand-fired furnaces,

David M. Updike, combustion engineer, and John J. Phillips, assistant sales manager, Bradley Mahony Coal Co., with J. M. Young, Lehigh Navigation Coal Co., Inc., enjoy the meeting.

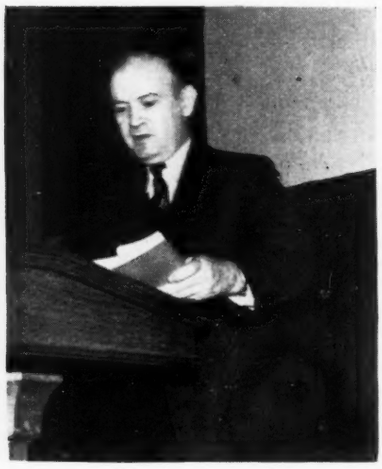


Awaiting start of third session: W. H. Lesser, mechanical and electrical engineer, Pierce Management; Leslie Lamont, division superintendent, Philadelphia & Reading Coal & Iron Co., and J. S. Johnson, superintendent of preparation and maintenance, Hudson Coal Co.

E. T. Selig, Fuel Savers, Inc., and George T. Kohler, Fitzgibbons Co., Inc., renew friendships.

Caleb Kenny, vice president and general sales manager, Weston Dodson Co., officiates at fifth session.

Allen J. Johnson, director, Anthracite Industries Laboratory, details developments in the control of anthracite combustion.



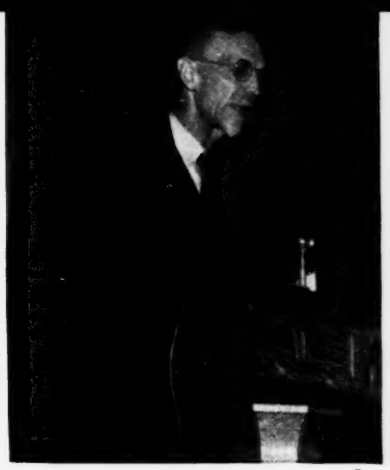
Hugh L. Campbell, Jr., Hazleton Brick Co., elaborates on use of anthracite in the manufacture of brick.

Dean A. C. Callen, Lehigh University, summarizes the conference.

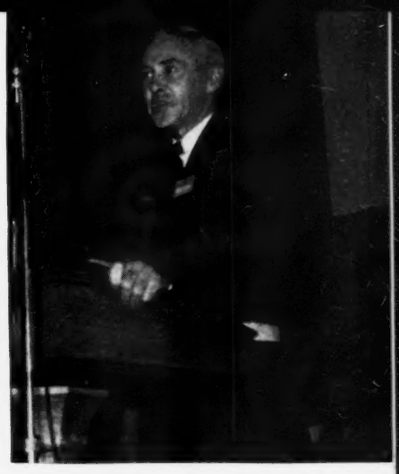
Eric Sinkinson, associate professor, fuel technology, Lehigh University, discusses apparatus for making superior activated carbon from anthracite.

C. A. Gibbons, general manager, Susquehanna Collieries Co., guides fourth session.

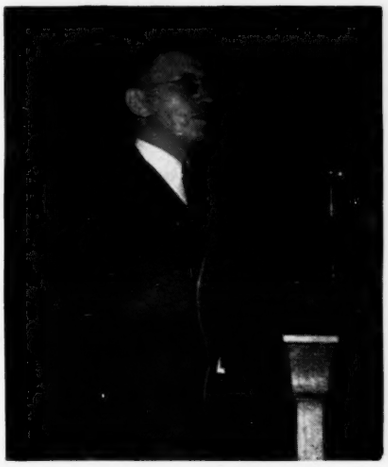
"If we take care of the ultimate consumer, sales will take care of themselves," says C. A. Fraser, president, C. A. Fraser, Inc., Albany, N. Y.



"Skipper" Eckfeldt, chairman of the arrangements committee and professor of mining engineering, Lehigh University, directs the conference.



Use of anthracite in foundry cupolas described by J. F. K. Brown, assistant general manager of engineering, Hudson Coal Co.



T. G. Foulkes, assistant engineer of tests, Bethlehem Steel Co., Bethlehem, Pa., guides the second session.

Frank C. Wright Jr., vice president, Philadelphia & Reading Coal & Iron Co., delves into future research for the anthracite industry.

M. A. Young, general manager, Catskill Metal Works, tells of trends in boiler and furnace design for greater efficiency with anthracite.

F. E. Filson, Gannett, Eastman & Fleming, architectural engineers; J. D. Jillson, sales engineer, Anthracite Industries, Inc., and John E. Shurtleff, salesman, Pennsylvania & Hudson Co.

Carl S. Marty, Kimberly-Clark Corporation, Jenkintown, Pa., and Robert S. Vail, manager, Richard J. Harrigan, Inc., Plainfield, N. J., compare views.

Dr. C. C. Williams (center), president, Lehigh University, discusses conference progress with H. H. Otto (left), mining engineer and D. W. Shimer (right), enginer, Hudson Coal Co.

to avoid explosions from stoking stove and nut anthracite as if it were coke. Budget selling is another service which pays the dealer.

Anthracite requires less combustion space than any other fuel except gas and provides more fixed carbon per cubic foot than any other fuel, hence, with these advantages, why should not boilers and furnaces be built that would be superefficient with anthracite and yet not readily adaptable to other fuels? queried M. A. Young, general manager, Catskill Metal Works, Catskill, N. Y., at the Thursday afternoon session, with E. G. Bailey, president, Babcock & Wilcox, New York, in the chair. The only changes in hand-fired boilers for 30 years are streamlined door handles and pretty jackets. Tonnage of metal has meant more to manufacturers than consumer acceptance, satisfaction and enthusiasm.

From actual experience with a 36-in. cupola, egg and grate coal appear to melt iron equally well, stated J. F. K. Brown, assistant general manager of engineering, Hudson Coal Co., Scranton, Pa., speaking for himself and Earl E. Roecker. Voids in egg are 42.03 per cent and in grate 43.57 per cent, an unimportant difference. The fire was brought to the same stage in about the same time by coke or anthracite of either size; in fact, with coke the cupola was charged after 70 to 78 minutes of elapsed time and with anthracite after only 65 minutes. Both coke and anthracite break in the cupola, but anthracite apparently fractures more severely, yet without affecting results.

Where Coal Has Edge on Coke

Whereas the ratio of coke to iron usually is 1 to 10, and is 1 to 7.5 where high temperatures are required, the rate used with coal was 1 to 10, and 1 to 15 might possibly serve the purpose. The higher percentage of coal would improve the quality of the iron. However, the use of anthracite is definitely economical.

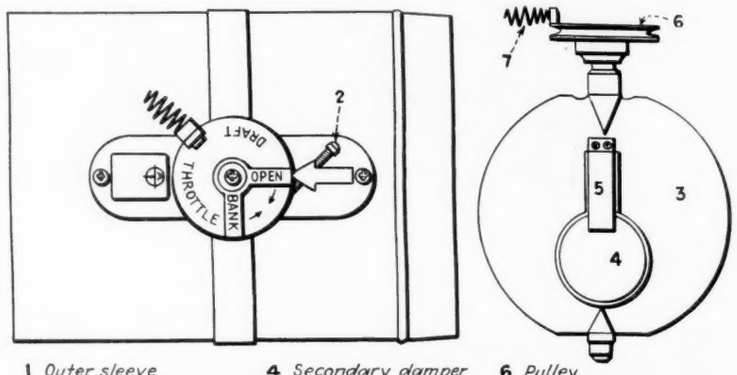
With coke, 4,500 lb. of metal can be put into the cupola by filling it up to the charging door. Because anthracite occupies so small a space for equal heat value, 7,500 lb. of metal can be charged when that fuel is used. In a 14,000-lb. heat, using anthracite, half the charge can be loaded before the blast is started, leaving the rest to be loaded later, but when using coke only a third can be loaded before the blast and two-thirds has to be loaded afterward. Time from beginning-of-blast to metal-over-spout with coke is from 8 to 15 minutes and with anthracite is 10 to 13 minutes, so anthracite again would not appear to be as slow a fuel as has been alleged.

A wonderful opportunity to expand is about to be presented to the anthracite industry, prognosticated J. D. Jillson, Anthracite Industries, Inc., because war-time activity will make increasingly greater demands on anthracite as a domestic fuel to replace those fuels which have "gone to war." For steel making, much coke will be diverted from the domestic market. War-time demands on the petroleum industry, a shortage in fuel-oil tankers, and government control of oil undoubtedly will raise the price of fuel oil and, through priorities, may curtail use of oil as a domestic heating fuel.

Stoker research, announced Frank C. Wright Jr., vice president, Philadelphia & Reading Coal & Iron Co., can make two important contributions: Development of (1) an inexpensive stoker to burn large sizes and (2) a stoker less expensive than present stokers to burn buckwheat and rice. For gas making in sets less than 6 ft. in diameter, egg coal has been found superior to broken coal. The principal difficulty with anthracite in gas manufacture has been that it breaks in the generator, but, if it is shown that most of the spalling occurs when the coal is first subjected to that heat, then some inexpensive yet gentler way of preheating the charge should be sought, such as a recirculation of waste-heat gases.

At the banquet, Frank Earnest, Jr., president, Anthracite Industries, Inc., presided, addresses being made by C. C. Williams, president, Lehigh University, and Thomas Dickson, Dickson & Eddy. Basing the value of anthracite on the cost as delivered to the consumer, Mr. Dickson said, anthracite is still an industry producing annually $600,000,000 worth of product and worthy, therefore, of pride and respect. In his belief "it would yet win back a large tonnage."

Samuel Johnson, the British lexicographer, in a moment of embitterment, declared, said Judge Robert Virgil Fletcher, vice president and general counsel of the Association of American Railroads, that "patriotism is the last refuge of a scoundrel," and too many today who speak loudly of national defense have their eyes mainly on local, personal or political advantage. Particularly are some anxious to start the construction of highroads and waterways, even though they know they cannot be completed in time to help in national defense.



1 Outer sleeve
2 Adjustment screw
3 Main damper
4 Secondary damper
5 Bimetal
6 Pulley
7 Hand lever

Fig. 3—Anthracite Industries' draft throttle that gives better regulation of domestic furnaces.

Neither isolationist nor appeaser, he nevertheless could not close his eyes to the fact that the construction of the Tombigbee, Florida and St. Lawrence waterways would jeopardize rather than aid defense. The St. Lawrence project would cost $100,000,000 annually and take ten years to complete. All kinds of defense schemes are afoot. Some would have the State take over the railroads, so that any industry that does not fit in with the plans of the Federal authorities could be told bluntly: "Build where you please, but our railroads will not service the plant when built." "The ramparts we watch" must be those we have erected against domestic invaders of our way of life and principles as well as those we have built against foreign foes.

Three factors primarily affect water-gas generator fuel beds: heat-storage capacity, character of clinker and resistance of fuel bed. The first is a function of reactivity, specific heat, density of fuel and rate of blasting, said C. C. Wright for himself and L. L. Newman, both professors of fuel technology, Pennsylvania State College, at Friday's morning session, with C. A. Gibbons, general manager, Susquehanna Collieries Co., Nanticoke, Pa., in the chair. The experiments made show that anthracite is superior to competing fuels in heat-storage capacity, largely because of its greater density. Clinker formation is largely a function of fusion temperature of ash, fluidity of ash when molten and distribution of generator temperatures. The last can be controlled by correctly proportioning the cycle of operation.

Work of the Mellon Institute of Industrial Research, described already in many places in *Coal Age*, was summarized by Dr. Rose, senior industrial fellow, who declared that anthracite ashes improve texture and workability of soil, aid drainage and aeration, increase moisture absorption, reduce erosion, and resist drought.

Anthracite Will Burn Brick

With the use of forced draft in kilns for the burning of brick, most of the objections to the use of anthracite can be eliminated, asserted H. L. Campbell, Jr., vice president and general manager, Hazleton Brick Co., Hazleton, Pa. It has been assumed without justification that heat from anthracite lacks "reach" and that a long-flame high-volatile coal is indispensable. Anthracite, it is said, gives intense heat near the firebox and inadequate heat beyond. When stack height or stack area is increased or an induced-draft fan is used, hard coal becomes efficient.

With anthracite, all colors of brick obtainable with bituminous coal firing have been produced, despite the general declaration that it couldn't be done. With anthracite, but not with bituminous coal, waste heat for drying the raw ware can be drawn from the kilns before burning has finished. As soon as the bottom bricks are a dull red, waste heat can be conducted to the drying tunnels, giving additional draft. Many Eastern plants, said Mr. Campbell, could with advantage adopt hard coal for burning. Face brick also can be made from the accumulations of slate banks, but the temperature must be allowed to drag so that all the carbon will be burned away.

When fires are banked, stacks cool, and when a hotter fire is desired, the draft only slowly reestablishes itself; otherwise, lack of draft is due to faults in construction or in maintenance of chimney and connections or to poorly designed or poorly operated draft controls, declared Allen J. Johnson, director, Anthracite Industries Laboratory. Anthracite can be banked to as low as 3 per cent of full boiler capacity without danger of extinguishment, but with standard dampers a 10 to 30 per cent banking is provided. A sudden stoppage of air in a hot fire is one of the most certain causatives of troublesome clinker. Draft control is responsible for the extent and suddenness of such changes. The new draft throttle, hitherto sold mostly to the underprivileged, has proved either "very satisfactory" or "satisfactory" to 90.7 per cent of the users, with 6.4 per cent "on the fence" as to its merits and 2.9 per cent who regard is as "unsatisfactory."

Thermal comfort of the human body is conditioned by physiological as well as physical factors, postulated C. P. Yaglov, professor, Harvard School of Public Health, Boston, Mass., at the final session, with Caleb Kenney, vice president and general sales manager, Weston Dodson Co., Bethlehem, Pa., in the chair. Consequently, standard air conditioning cannot assure equal comfort to all persons.

If the environmental temperature is high, more blood is shunted to the skin to raise its temperature and provide the water needed for sweating and consequent temperature reduction, but the mechanism of heat regulation is not present at birth and must be developed, and illness, old age, overwork, malnutrition and accident may impair it, so that degrees of heat or cold barely felt by healthy persons cannot be endured by such individuals.

Activated carbon of anthracite derivation, asserted Eric Sinkinson, associate professor of fuel technology, Lehigh University, is harder than vegetal carbons, can stand rougher handling without producing too much dust, and its apparent density of 0.4 places it in the same class as the best activated carbons from direct vegetal sources. Active carbon is formed from inactive by treating the latter with steam at a suitable temperature in an inclosure usually free from air.

The coal first was reduced to 8x14-mesh and heated in the presence of steam at about 1080 deg. C., the temperature being kept fairly constant. Exposed to these conditions, the coal became most effectively activated after 13 hours, at which time the ash content had risen to 7.40 per cent. After a total of 29 hours of treatment, the ash content was 59.1 per cent and the "life" of the activated carbon with chloropicrin adsorption had dropped from the excellent figure of 46 to 9 minutes. As evaluated under the foregoing condition, the untreated anthracite had no adsorptive qualities and did not begin to have them until after four hours of treatment.

Using air and steam together does not seem to speed up the reactivity of the coal; it causes it only to burn away more rapidly. Under the microscope, it can be seen that, as the result of the treatment, the coal is scarred by long fissures. Activated carbon from anthracite, when immersed in zinc chloride, is slightly deteriorated thereby, despite a noticeable rise in temperature at the moment of immersion.

During the last five years more than a million water heaters using coal or wood were sold in this country and about 80 per cent of them were heated with anthracite, stated R. C. Johnson, industrial fellow, Mellon Institute of Industrial Research. They usually are rated and sold in terms of the quantity of water they will heat at full burning rates, but, in normal household operation, the hot-water demand is intermittent and the heater burns at full rating for only a small percentage of the time, so some other rating is desirable. The result of tests is shown in the accompanying table.

Draw-Off and Standby Test of Hot-Water Heater

	Actual draw-off, gal. per day			
	0	30	50	75
Average outlet temperature, deg. F.	....	140	144	140
Average inlet temperature, deg. F.	....	38	38	38
Draw-off calculated to 100 deg. F., gal. per day	....	30.4	53.1	76.2
Av. wt. of anthracite used, lb. per day	5.9	8.9	11.5	13.4
Efficiency per cent	....	20.7	28.3	34.8
Attentions per 24 hours, no automatic temperature regulation	1	4	5	4.6
Cost of fuel, per month	$0.89	$1.34	$1.72	$2.01

FOREMEN'S QUESTION FORUM

How to Put Drive Into First-Aid And Mine-Rescue Training*

By **DENNIS J. KEENAN**
State Mine Inspector
Barnesboro, Pa.

SAFETY work has been found to be fostered greatly by aggressive development of first-aid and mine-rescue training, for a man who is a first-aid man will always be an advocate of safety. Safety is too often regarded merely as *not* doing unsafe things and as *avoiding* certain quite natural but dangerous impulses. No one becomes enthused over not doing things that one's natural energy urges one to do. On the other hand, first aid and mine-rescue work satisfy the natural impulse to do things and to learn to do them rightly, and a man once interested in making things right instinctively interests himself in preventing them from getting wrong. These then are the positive approaches to safety—the up-and-doing ways of attaining it. So first-aid and mine-safety training are mileposts on the road to safety, and trained men are the centers from which safety will spread throughout any organization.

First-aid is best promoted by: (1) selecting key men who when trained can instruct others; (2) choosing these men not only with care but also from different sections of the mine; (3) training them in the open where they will attract as many spectators as possible; (4) awarding or, at least, recognizing, those sections of the mine with the largest percentage of trained men; (5) not allowing training to lag or be forgotten; (6) inducing local management occasionally to attend training sessions, thus showing an active interest in the work; (7) furnishing plenty of material and a well-located, well-ventilated and heated room for these exercises; (8) providing a short safety address for each training session; (9) discussing not merely proper treatment of the injury but also its prevention; (10) arranging for competitions between groups.

Success in promoting safety contests lies in: (1) choosing best location for such events; (2) obtaining cooperation of miners' union and of operators, individually and as a group, State departments of mines and Federal Bureau of Mines; (2) presenting suitable prizes and awards such as trips to points of interest with all expenses paid; (3) keeping organization alive in winter by banquets with safety addresses; (4) making membership drives throughout year; (5) demonstrating safety at contests; (6) having an outstanding safety expert deliver the principal speech on occasions when certificates of merit are awarded to those who have worked a certain number of years without a lost-time accident; (7) inducing manufacturers of safety and other mine equipment to sponsor and attend contests.

* Article read at mining session of the Western Pennsylvania Seventeenth Annual Regional Safety Engineering Conference, April 2, Pittsburgh, Pa., under the aegis of the National Safety Council.

•

Keep Water Out of Mine, but, Should It Enter, Get It Out Again as Fast as Possible

LIKE fire, water has ended the days of many a good mine, but many more have found it such a costly affliction that no profits could be made. Every effort should be expended to keep it out of mines. An unmined strip of coal should be left paralleling the outcrop on the rise side of the measures if there is one and other strips under even small streams that flow over the top of the coal bed, wherever the cover is less than 100 ft. thick. Where the streams are rivers, it is best to leave the entire flood plain undisturbed. The outcrop strip usually can be mined later by stripping. Such removal will be less costly and more effective than by underground work, even to a depth of 50 ft., especially if a large area is thus mined.

The understream strip will be a body of coal that, if generous enough, can be mined economically by underground methods later. Usually a small sag in the measures has caused water to escape down the side of the hill to form the stream, or it would not be there. In consequence, there usually is water in the rocks on both sides of the ravine, so it is well to leave plenty of coal. If only a little is left, the one or two workings that can be driven into it will produce so little coal when the time comes to work it that they will interfere with production in other areas and may not reward removal.

Extracting all the coal in a mine gives tight falls and small crevices, thus reducing the quantity of water entering the workings and keeping air from the mine, which will make that water acid. Only large pillars should be left in place or pillars so small that they will be crushed completely. With mechanization, areas are soon divested of their coal and, that done, there should be less water to handle than if the same tonnage came from a larger area.

Where pillars are left, water enters and the bottom heaves, preventing that water from escaping promptly to the heading even if the original slope of the bottom once was such as to favor such movement. The fall of this water will oxidize the pyrite and its rise enable it to dissolve the acid thus formed.

Looking to the Future

Where measures dip, care should be taken to provide gravity drainage for all the coal lying above the level of the bottom of nearby streams. From the beginning a good pillar should be left below this drainage level to keep the water from traveling on beyond it. With that in mind, a drainage entry should be driven as nearly level as convenient. Two or three inches rise in 100 ft. will suffice where the entry has far to go, but more is better if the distance is short for, with a steeper gradient, haulage is facilitated, and any dips encountered on the way will be more easily drained by a little ditching or bottom lifting. Another water level 500 ft. below the first will keep the water entering between the levels from having to be lifted over 500 ft.

On idle days, the foreman can make a tour of inspection over the surface above the mine and note points where water, and perhaps air, is leaking or can leak into the workings. In some cases where shallow rooms have caved to the surface, it may be profitable to hire a bulldozer to level off the ground, establishing a gradient over which the water will shed readily. Especially, should care be taken to protect such places against rising streams that may flood the mine.

In other instances, ditches can be made to divert the water around openings on the hillside. If necessary, flumes of pipe or

wood can be constructed, but, as these may be stolen or broken, grading, where effective, is more desirable. Strippings made before the underground workings of the mine are completed may bring on a flood of water if the floor of the coal dips toward the workings. Here extensive flumes may have to be constructed.

Once in the mine, the water should be removed rapidly by gravity either to the surface or to a sump. If the coal at any point is higher than the sump or the exit to the surface, the water usually will flow all the way if confined in a pipe and if lifted to the top of the first hill, for it will go by hydraulic pressure up and down, following the rolls in the pipe.

In this way, the water will have to be pumped only once rather than from every low point to the nearest high point, with sumps and pumps provided at every low point or swag. With the latter misarrangement, not only will pumping charges be high for labor, power and material but the water may flood working areas, causing great inconvenience and, still more, gathering acid and so destroying pipes and pumps.

It has been found that the water that enters the mine is never acid, and indeed any foreman will testify that he has never found corrosive water at the face of the workings. So it must be in running through the mines that it gets acidulous, and the way to keep it free from acid is to get it out as soon as possible. It is certain that it will not become acid in pipes. Perhaps, water is entering from active workings along the line, in which case that coal should be taken out as soon as possible or left in place until mining ends.

Water can be pumped into the main pipe from this subsidiary dip, if necessary, and perhaps it may be led or even sucked into the main pipe by the movement of the water in the pipe. A check valve will prevent the water from traveling in the wrong direction. If there is merely a low place on the road, it will pay good dividends to raise it so that water cannot gather and haulage gradients can be eased. Water kept at a uniform level will not get acid, no matter how long it stands.

Ditch Better Than Drain

A common fault is to call for a pump, when a little grading would make its use unnecessary. Water that has to be pumped every few days or hours is a constant annoyance, interfering with the foreman's main job and preventing his prompt performance of constructive work. Except at the face adding a gathering pump nearly always will add a large part of the time of one man on the payroll, for pumpmen who have a few pumps to handle spend their time mainly in traveling from place to place. When a pump is installed, it usually is stated that it can be started by someone incidentally to his daily job, but, after the pump has been running a while, it is found that there is a reason for more attendance or some expert maintenance, and the problem does not work itself out as easily as was expected. Sometimes the water can be bled away by another heading or may be taken to the surface by driving a small heading into a ravine.

Where the water has to be pumped to the surface, the management will have to choose whether to provide a large sump and pump on the night shift, thus improving the electrical load factor, or to pump continuously. The former plan is the more popular, but, with large sumps and discontinuous pumping, the water will become intensely acid, and the main pump and lines will give much trouble and expense.

Some companies use rubber pipe and find it extremely profitable. Alloys are being used to protect the pumps from corrosion, but to some it would seem better to control acidification. When mine water is abnormally acid, it is a foreman's job to get it back to normal, but the best time to get the desired result is when the mine is started. In some degree, acidification does not happen; it is caused.

•

Shawmut Mining Company Issues Instructions for Timbermen

In its "Safety Rules for Employees," the Shawmut Mining Co., St. Marys, Pa., gives rules for timbermen and rockmen as well as for its other employees, and, to be sure that all of them will read the following admonition, it is used again and again to preface the instructions to each classification of workers—a sort of refrain they cannot miss: "All injuries received in the course of employment must be reported promptly to the assistant mine foreman or the mine foreman." The rules conclude with the suggestion: "Please consult the Bituminous Laws of the Commonwealth of Pennsylvania, especially Article XXV, Rule 1."

Using One's Head

Quotations from the rules follow: "All employees must use the vibration method of testing roof, which consists in placing the bare fingers of one hand or the head against the roof while striking the material with a suitable tool. If the material so struck gives off vibrations which are readily felt, or if the material moves, it is loose and dangerous. Where the roof cannot be reached by the hand, a rod held against the roof will transmit any vibration to the hand. Miners shall be required to test the roof whenever an official enters their working places.

"You must have sufficient tools in good condition to get the best results from your work. You must also keep two 3-ft. pieces of rubber hose with your kit of tools, which must be used in working about bare power wires and cables.

"You must take down or secure all loose roof or side before starting to work under it. Set temporary posts to protect yourself while preparing and placing permanent timbers. The latter must be set in line with adjacent timbers.

"You are forbidden to store blocks, old or new timber or refuse of any kind on the clearance side of the headings, or in front of or in shelter holes. Surplus new timber must be moved to where it is needed, and old timber, short blocks which are unfit for use, and refuse of all kinds must be loaded into cars and sent outside.

"Use only permissible explosives and approved detonators unless authorized by the mine foreman to use other explosives. They should be carried in approved containers. Explosives and detonators should be stored at least 5 ft. apart and at least 50 ft. from the working place.

"If a job is not completed at the end of your shift, notify the assistant mine foreman or the mine foreman of any special danger, and put up proper danger signs to warn men approaching the unsafe place.

"After drilling a series of holes, only those holes shall be charged that are to be fired immediately. The holes shall be fired one at a time in regular order before doing any other work, and in no case shall charged holes be left unfired when you leave the job for any purpose."

Use of the head as a means of determining the presence of vibrations is at least unusual and should be quite effective. Some may question whether the test can be made with equal safety as with the hand, but, if the roof is going to come down, it will have less distance to fall to the head than if the hand is used and the possibility of escape from a fall in any case is questionable.

•

Anything That Takes Oxygen Makes Irrespirable Air

It seems obvious that anything that will oxidize actively will take oxygen from air and leave nitrogen behind, making the air unbreathable, but, under certain circumstances, many people would fail to recognize that fact. Two boilers, says the *Esso Safety Bulletin*, were used for the storage of feed water, but, for six months after their use for that purpose, they were kept empty and tightly closed. Apparently, they took a large part of the oxygen from the stagnant air of the boilers, for only 16 per cent of the atmosphere in them was oxygen when a test was made.

When a man with a safety lamp got into the boilers to remove the rust, he was overcome, as was his assistant, who got in to find out why the first man did not respond to his calls. Finally the lower holes in the boilers were opened for ventilation, and men entered with hose air masks, and the lives of the men were saved.

Investigators have found that the hemoglobin of the blood will not combine with oxygen to its full capacity unless the oxygen in the air by volume occupies about 16 per cent of the atmosphere. By volume, normal air is 20.93 per cent oxygen. The oxygen of the air at the time the men collapsed must have been much lower than 16 per cent.

It may be added that another gas that conceivably might have been present is hydrogen, for iron filings in acid water, as is well known, will cause the water to decompose and liberate that gas. Somewhat less speedily, iron plates would cause the same reaction. It is unlikely that the water was sufficiently acid to free the hydrogen, as is suggested by the fact that the safety lamp did not cause an explosion. However, in hydrogen a safety lamp does not give adequate protection unless the oxygen content is low enough to prevent the atmosphere from exploding. Hydrogen in normal air burns with such a vigorous flame that a safety-lamp gauze will not cool it fast enough to prevent it from passing between the meshes and igniting the outside air.

QUESTIONS ASKED BY STATE BOARDS

Questions, Mine Examiners' Examination Illinois, 1940

Firedamp

Q.—What constitutes firedamp; and what gaseous mixtures does it include?

A.—In this country the term "firedamp" is applied to any flammable or explosive mixture of methane and air, though other explosive or flammable gases also may be present; firedamp always contains extinctive gases, such as carbon dioxide and nitrogen, usually in excess of the quantities present in natural air, and is somewhat deficient in oxygen. The presence of the extinctive gases and the deficiency in oxygen greatly modify the character of the firedamp, the flammable or explosive gases increasing and the extinctive gases decreasing the danger of the mixture.

Hydrogen may occur in any mine having storage batteries or acid water and steel pipes, in places where explosives have been detonated or where there is a mine fire, especially if water is present. Ethane occurs in mines near wells where natural gas is being produced or near pipes where natural gas is being conveyed. Nitrogen oxides from explosives also occur. Ethane and hydrogen are highly explosive, having a lower temperature of ignition than methane, thus rendering the firedamp more easily ignitable and dangerous.

Most Violent Firedamp

Q.—At what percentage is firedamp most explosive?

A.—The maximum explosive mixture of pure methane with pure air is that when the proportion of methane to air is as 1 to 9.55, or, in other words, when the mixture contains 9.48 per cent of methane.

Q.—A mixture of air and methane having the most explosive percentage of the latter, is passing through an entry 6 ft. high and 8 ft. wide at a velocity of 400 ft. per minute; what quantity of air will be required to dilute this mixture until it contains only 1 per cent of methane?

A.—The total volume of air and methane passing in this entry is 400x6x8 = 19,200 cu.ft. per minute. A mixture of methane and air (CH_4) at its most explosive point contains 9.46 per cent of methane when no other gases than normal air are present. On this assumption, the quantity of methane present in the current circulating in this entry is 0.0948 × 19,200 = 1,820.16 cu.ft. per minute. Now, if this methane is to form 1 per cent of the return current—that is, to form a mixture with a proportion of air to methane of 99 to 1—it will be necessary to provide 99 times as much air as methane, or 180,195.84 cu.ft., per minute and the volume of methanized air in the return will be 100 × 1,820.16 or 182,016 cu.ft. per minute.

Mine Gases That Explode

Q.—Name gases found in coal mines, stating which are explosive and which non-explosive and give chemcal symbols of each.

A.—The principal gases found in coal mines are the following: nitrogen (N), oxygen (O), methane (CH_4), carbon monoxide (CO) and carbon dioxide (CO_2). In addition to these principal gases, occur, in limited quantities, hydrogen sulphide or sulphureted hydrogen (H_2S), and hydrogen (H) and perhaps other gases after an explosion. Carbon dioxide and nitrogen are the only gases that are not explosive. Oxygen is regarded as not being explosive, but, as it combines with methane and hydrogen with explosive violence, there is no reason to exonerate oxygen.

What Coals Explode

Q.—Give the particular characteristics of coal, in respect to chemical composition and texture, that render it liable to cause an explosion, in the process of mining.

A. All bituminous and lignite coals will explode if finely broken and suspended or raised into the air. The low-volatile coals are as dangerous in this respect as any. Their friability makes them exceptionally dusty and the dust is very fine, so they are quite subject to explosion. Lignites are less explosive. Anthracite is almost proof against explosions, though those anthracites with the marginal percentage of volatile matter may have some degree of explosibility. Briefly stated, liability to explosion depends chiefly on the flammability of dust and the fineness of its particles.

•

Questions Asked Applicants for Second Class Mine Managers' Certificates, Illinois, 1940*

Ventilation Required

Q.—When is a mine properly ventilated? Explain fully.

A.—A mine is properly ventilated: (1) when a sufficient quantity of air is provided to meet every requirement of the mining laws; (2) when this air is distributed about the mine in such a manner as to prevent the accumulation of gases in the working places and elsewhere; (3) when a minimum of the air is recirculated, and (4) when the mine atmosphere is made by these provisions safe and healthful.

Firedamp and Afterdamp

Q.—What is meant by the terms "firedamp" and "afterdamp"? Explain fully.

A.—Firedamp is any flammable or explosive mixture of methane and air. It may contain varying quantities of other mine gases. Afterdamp is the term commonly applied to the gases produced by mine explosions or mine fires, and may contain varying quantities of such gases as carbon monoxide, carbon dioxide, oxygen, nitrogen, methane, hydrogen, and water vapor. It may also contain smoke.

Measuring Air Current

Q.—(a) How would you find the quantity of air traveling through a mine? (b) An anemometer registers 120 r.p.m. in an airway 12 ft. wide and 6 ft. high; what is the quantity of air passing per minute?

A.—(a) Choose a point in the intake airway where the cross-section is uniform and the passageway straight. Find the cross-sectional area of the entry at this point; take a reading for one or two minutes with the anemometer, holding the instrument at right angles to the current and at arm's length, moving it about in the entry so as to obtain a fair average reading over the entire cross-section.

The reading of the instrument divided by the number of minutes it is exposed to the current will give the velocity of the air in feet per minute. Multiply this velocity by the cross-sectional area of the airway, in square feet, and the product will be the quantity of air in circulation expressed in cubic feet per minute.

(b) Area of airway = 12 x 6 = 72 sq.ft.
Quantity of air passing = 72 x 120 = 8,640 cu.ft. per minute.

* Continued from page 66, *Coal Age*, May, 1941.

Chief Mine Electricians' Examination Pennsylvania, 1940*

Cannot Insulate Magnetism

Q.—How would you insulate magnetism?

A.—Magnetism cannot be insulated; however, lines of force may be diverted by the introduction of a better path, such as soft iron between the magnet and the articles to be protected. (1 per cent.)

Q.—(a) In a gassy portion of a mine, what is the maximum voltage permitted for signaling purposes? (b) What are the legal requirements with regard to bare signal wires? (c) What are the legal requirements with regard to bells, wires, insulators, contact makers and other equipment used in connection with electrical signaling underground?

A.—(a) Maximum voltage for signaling purposes is 24 volts. (1 per cent.) (b) Bare wires shall not be used for signal circuits, except in haulage roads. (2 per cent.) (c) Bells, wires, insulators, contact makers and other equipment used in connection with electrical signaling underground shall be of suitable design, of substanital and reliable construction, and erected in such manner as to reduce to a minimum the likelihood of failures or false signals. (3 per cent.)

Q.—What word is used to indicate the presence of high-voltage machines, equipment and lines, and how often is the word used?

A.—The word DANGER should be used and at frequent intervals. (1 per cent.)

Why Bond Mine Rails

Q.—(a) Why are rails bonded? (b) Why should cross bonds be used? (c) Why is is necessary to bond around switches, frogs, etc.?

A.—(a) Rails are bonded to provide an effective continuous electrical path for the current and to simplify the electrical transmission system. (2 per cent.) (b) Cross bonds should be installed to provide a continuous electrical path for the current should rail joint bonds become loose or break off, and for equal distribution of current in the track system. (2 per cent.) (c) Where tracks are joined, frogs and switches necessarily are required; therefore, many joints are introduced; these joints must be properly bonded to provide a continuous electrical path for the current across switches. (2 per cent.)

Q.—(a) What are the legal requirements with regard to fuses? (b) What does the law demand with regard to switches?

A.—(a) Fuses shall be stamped or marked, or shall have a label attached, indicating the maximum current which they are intended to carry. (2 per cent.) (b) All switches, circuit breakers and fuses shall have incombustible bases. (2 per cent.)

Q.—What effect does an excessive drop in voltage have on motors when under heavy load?

A.—Speed of motors will be reduced in proportion to drop in voltage. Their efficiency will be reduced accordingly, and the windings and cables will be subjected to an excessive rise in temperature due to an excessive increase in the current flowing through them. (4 per cent.)

Q.—What types of d.c. motors are used for mine work?

A.—Series, shunt and compound-wound motors. (1 per cent.)

How to Arrest Lightning

Q.—What are the legal requirements with regard to lightning arresters in surface d.c. systems?

A.—If the transmission lines of low or medium voltage from the generating station are strung overhead, lightning arresters shall be installed at the generating station in connection therewith. If the distance from the generating station to the point where the lines enter the mine is more than 500 ft., an additional arrester shall be installed at this point, and in no case shall the arresters be more than 1,000 ft. apart. (1 per cent.)

Q.—How does the Pennsylvania mining law require electrical cables other than signal cables to be joined?

A.—Where cables other than signal cables are joined, suitable junction boxes, shall be used, or the joints shall be soldered, and the insulation, armoring, or lead covering replaced in a condition as good as in the rest of the cable. (4 per cent.)

Q.—Where, in mines, are series-wound motors principally used?

A.—Series-wound motors are used principally in mine locomotives. (1 per cent.)

Q.—If the voltage of an electrical system is doubled, what effect will it have on the current?

A.—When the voltage in an electrical system is doubled, the current to be transmitted will be halved. (2 per cent.)

* Continued from page 67, *Coal Age*, May, 1941.

Questions, First Class Mine Managers' Examination, Illinois, 1940*

Air Going to Each Split

Q—If 50,000 cu.ft. of air per minute is passing into a mine, and the current is divided between two splits whose dimensions are as follows: Split *A*, 5x8 ft. in cross section and 3,000 yd. long; Split *B* 6x9 ft. in cross-section and 5,000 yd. long, what quantity will pass in each airway?

A.—In natural splitting, the quantity ratio is equal to the "potential ratio". The relative pressure potential X for any airway $= a \times \sqrt{\frac{a}{lo}}$ where a = cross-sectional area, l = length and o = perimeter.

Substituting values: Split *A*, $a = 5 \times 8 = 40$ sq.ft.; $l = 3{,}000 \times 3$ ft. = 9,000 ft.; $o = 2(5+8) = 26$ ft. and

$$X_a = a \times \sqrt{\frac{a}{lo}} = 40 \times \sqrt{\frac{40}{9{,}000 \times 26}}$$

$= 40 \times \sqrt{0.001{,}709} = 40 \times 0.130{,}744 = 0.522{,}97$

Split *B*, $a = 6 \times 9 = 54$ sq.ft.; $l = 5{,}000 \times 3 = 15{,}000$ ft.; $o = 2(6+9) = 30$ ft. and

$$X_b = a \times \sqrt{\frac{a}{lo}} = 54 \times \sqrt{\frac{54}{15{,}000 \times 30}} =$$

0.591,54

Then, $\frac{X_a}{X_b} = \frac{0.522.97}{0.591,54} = 0.884$

or, if $X_b = 1$, X_a will equal 0.884

Then calling q_a the quantity of air passing in Split *A*, and q_b the quantity passing in Split *B* per minute, as the total quantity is 50,000 cu.ft.

$$\frac{q_b}{50{,}000} = \frac{X_a}{X_a + X_b} = \frac{0.884}{0.884 + 1} = 0.469{,}214,$$

and $q_a = 50{,}000 \times 0.469{,}214 = 23{,}461$ cu.ft. per minute.

In like manner for Split *B*, we have $\frac{q_b}{50{,}000}$

$= \frac{X_b}{X_a + X_b} = \frac{1}{0.884 + 1} = 0.530{,}78$ and q_b = 50,000 x 0.530,78 = 26.539 cu. ft. per minute.

[The words "potential ratio" should be explained; $p = ksv^2 \div a$, but p is a constant in this case, k also is a constant if it is assumed that both splits have the same roughness. Thus, the only variables are s, v and a, which vary according to the split being considered, so $ksv^2 \div a = p$. Dividing both sides of the equation by ks; $v^2 \div a = p \div ks$. Again multiplying both sides of the equation by a, $v^2 = pa \div ks$. Therefore, dropping constants, v varies as $\sqrt{a \div s} = \sqrt{a \div lo}$, as stated above.

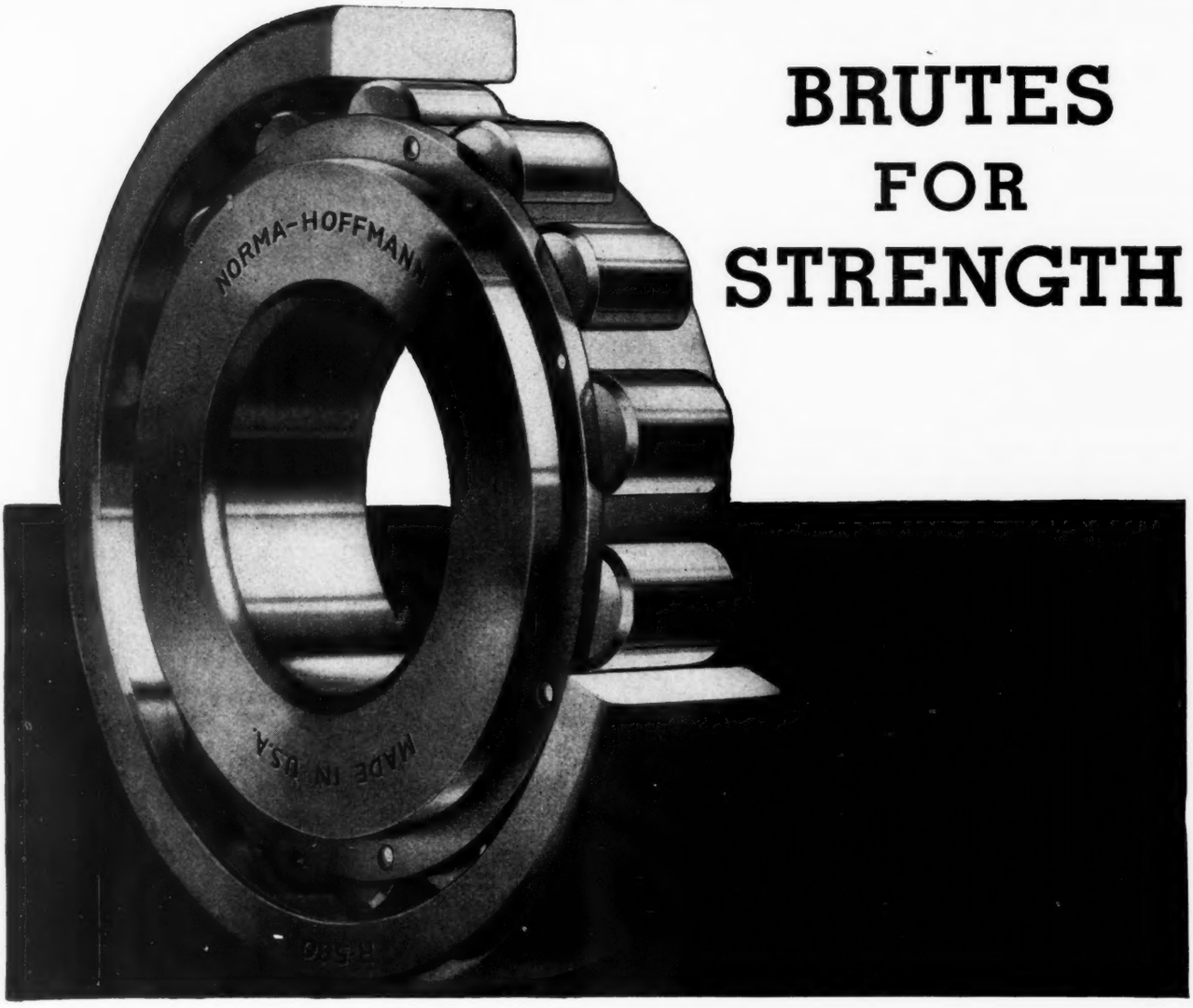
Hence the "potential ratio" better might be termed the "conductivity ratio" as it shows the ability of the split to conduct air, but, unfortunately, the electricians use this word not for gross conductivity but specific conductivity per unit of length and per unit of cross sectional area, so "viability ratio" would be a more desirable expression, as it measures the ability of the air to travel in velocity and quantity along the respective splits.]

Pressure on Dam

Q—A dam in a tunnel supports a vertical water head of 80 ft.; the sectional area of the tunnel is 70 sq.ft. Determine total pressure on dam.

A—Weight of 1 cu.ft. of water being 62.5 lb., total pressure exerted on dam is 80 × 62.5 × 70 lb. = 350,000 lb. = 175 tons.

* Continued from page 66, *Coal Age*, May, 1941.



BRUTES FOR STRENGTH

THE outstanding performance records made by NORMA-HOFFMANN PRECISION ROLLER BEARINGS under the heaviest and most exacting duties, are the logical result of the following distinctive factors:

Full line contact of rolling surfaces, affording a larger radial load capacity for continuous and intermittent service than any other type of single-row bearing, and providing a temporary overload capacity 50% above normal catalog rating, with greater resistance to shock and vibration.

Highly durable, completely machined and balanced bronze retainer riding on inner ring shoulders and minimizing internal load.

Lower frictional coefficient under heavy loads than any other single-row anti-friction bearing—due to extreme precision and design characteristics.

Test these PRECISION ROLLER BEARINGS in your own hardest service; remember that they have all the high speed qualities of the best ball bearings, and are interchangeable, size for size, with all single-row metric ball bearings.

Write for the catalog. Let our engineers work with you.

"NORMA-HOFFMANN"

PRECISION BALL, ROLLER and THRUST BEARINGS

NORMA-HOFFMANN BEARINGS CORPN., STAMFORD, CONN. U.S.A.

WHAT'S NEW IN OPERATING IDEAS

Ten Prizes Awarded Operating Kinks At the Cincinnati Convention

GREATER safety was the primary objective in the majority of the items awarded prizes of $10, a year's subscription to the *Mining Congress Journal* and a copy of the Congress' "Coal Mine Modernization Year Book" at the 18th Annual Coal-Operating Convention and Exposition of the American Mining Congress, held at the Music Hall, Cincinnati, Ohio, April 28–May 2. Along with greater safety, the prize winners also were designed to facilitate operation or cut cost.

Jerome White, Monroe Coal Mining Co., Greensburg, Pa., was chairman of the committee handling the Miners' Exhibit. Other members were R. L. Adams, Ted Bergrun, C. E. Butt, C. W. Connor Jr., E. A. Cottingham, William Cunningham, E. D. Gall, C. W. Gibbs, G. E. Hoover, William A. Howe, Glenn A. Knox, A. E. Long, S. F. McGurk, W. H. Steen and J. B. Taggart. Descriptions of the prize-winning kinks follow:

Combination Cutter-Chain Lock and Sheave Bracket—Designed especially for machines with the split-type bar, this device was submitted by James Burkett, electrician, Clearfield Bituminous Coal Corporation, Indiana, Pa. The lugs and round bar at the left (Fig. 1) extend down into the cutter-bar slot, while the other bottom lug goes into the space between the chain blocks.

When the handle of the round bar is turned toward the sheave, the bent portion

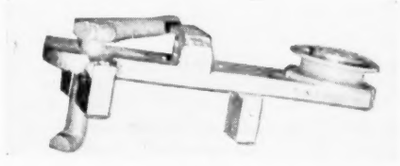


Fig. 1—Cutter-chain lock and sheave bracket.

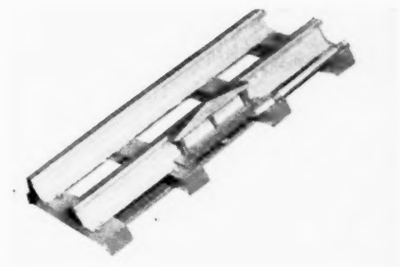


Fig. 2—Model of limit switch in place on incline track.

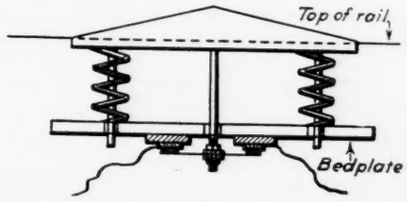


Fig. 3—Treadle springs and a spring leaf supporting the fingers insure good contact in limit switch.

on the bottom locks under the bar, while the handle itself goes into a protected position under the guard welded on the top center portion of the unit. The sheave provides a convenient means of positioning the rope to guide the cutter bar when dragging the machine endwise or when maneuvering it into position to sump.

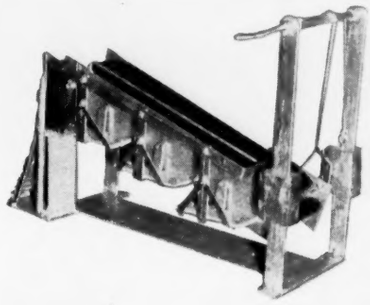


Fig. 4—Working model of boom with automatic walkway.

Limit Switch for Man-and-Material Incline—To prevent repetition of an operator's error which resulted in a car on the man-and-material incline at the St. Charles (Va.) operation of the Benedict Coal Corporation being pulled too far and damaging the hoisting equipment, Robert V. Fortner, general mine foreman, designed and installed the limit switch shown in Figs. 2 and 3. Fig. 2 was made from a photo of the model displayed at Cincinnati.

Operation of the limit switch trips an oil switch in the hoist-motor power circuit, which also cuts the power off a coil holding a mechanical brake in the "off" position. Application of the brake is softened by the retardation of an oil dash cylinder. Incline length is 3,200 ft. Grades range from 15 to 32 deg. and a 150-hp. motor is used on the hoist.

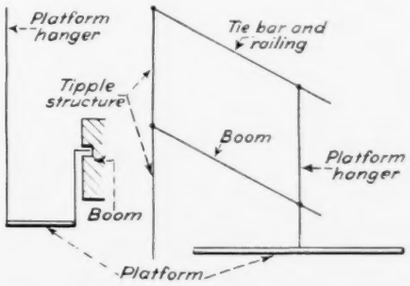


Fig. 5—End and side diagrams of hanger linkage for automatic boom walkway.

To prevent binding, holes in the bedplate of the limit switch are considerably larger than the three pins attached to the treadle. The single-pole double-break contactor consists of a spring brass bar carrying two contact fingers and insulated from its carrying pin. Treadle and contactor work equally well when the car approaches from either direction, and thus also could be applied to signaling or control at intermediate points.

Pantograph Equipment for Keeping Pickers' Platforms Level on Loading Booms—To provide safer accommodations for pickers on loading booms and increase their efficiency, E. L. Salyers, master mechanic, Wise Coal & Coke Co., Dorchester, Va., developed the system shown in Figs. 4 (made from a photo of a model) and 5. In this system, instead of the usual inclined walkway with high cleats, pickers work from a series of steps, or platforms, which, although supported by the boom, remain horizontal regardless of boom elevation.

The hanger for an individual step, or platform, remains vertical because it is one side of a pantograph, or parallelogram, linkage, the opposite side of which is the tipple structure supporting the boom pivot and the top tie bar of the linkage, which also serves as a railing (Fig. 5). Because the platform is attached rigidly to its hanger at a 90-deg. angle, it must remain horizontal regardless of boom inclination. The rise of the steps between the individual platforms becomes greater as the boom is lowered to start the loading of a car.

Catcher for Ball-Type Nips—Ball-type nips which will drop loose from the trolley wire when pulled in the opposite direction from normal are required in West Virginia. To solve the problem of supplying forked hangers where needed, Savage Adkins, chief electrician, Puritan Coal Corporation, Puritan Mines, W. Va., designed and built the catcher attachment shown in Figs. 6 and 7. The catcher is cut from 3/16-in. steel plate, with the section at the heel of the catcher prong bent upward.

The catcher can be placed on a hanger

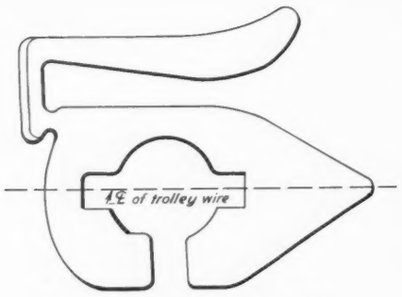


Fig. 6—Outline of ball-nip catcher.

or taken off in a second or two without tools. This operation consists of slipping it down over the wire on one side of the hanger, swinging it up over the wire on the opposite side, twisting it 90 deg. and then dropping it over the hanger clamp.

Sectional Steel Tie—No spikes are required for the "sectional-removable" steel tie (Fig. 8) developed by James C. Purdon and Arthur J. Dukes, Stonebridge Co., Cresson, Pa. The outside clips are integral with the tie, which is made in two halves with a lapped joint at the center to permit bolting them together. Inside clips are held by single bolts. This tie, it is stated, is intended for use where the rail joints are welded and therefore no angle bars are required.

Plug and Receptacle for Connecting Drill Cable to Mining Machine—To provide a definite place for connecting the drill cable to the wiring system of a d.c. mining machine and to insure correct polarity, John Fushko, mechanic, No. 2 mine, Pursglove Coal Mining Co., Pursglove, W. Va., built the receptacle and plug shown in Figs. 9 and 10.

Separate recesses in the fiber body of the plug accommodate 10-amp. 600-volt cartridge-type fuses, one for each of the two conductors. These fuses are covered by fiber plates attached by ¼-in. studs and wing nuts. Contact prongs are shielded to eliminate arcs and correct polarity is assured by a diagonal slot in the receptacle which matches a tongue between the prongs on the plug.

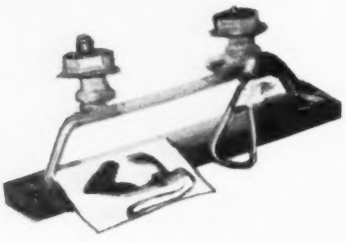


Fig. 7—Model of ball-nip catcher.

Fig. 8—Model of "sectional-removable" tie.

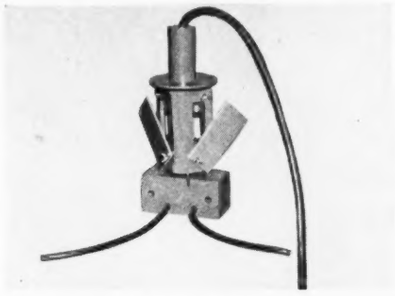


Fig. 9—Drill-cable plug in receptacle with the plates loosened to show fuses.

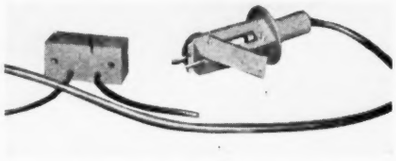


Fig. 10—Polarity in drill-cable plug and receptacle is assured by mating of tongue on plug with slot in receptacle.

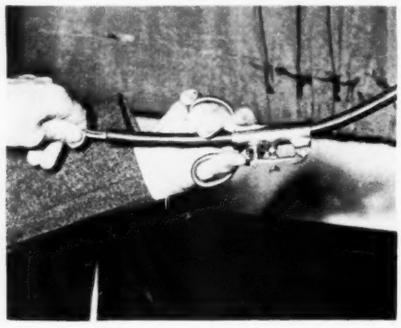


Fig. 11—This tool slits tough rubber jacket safely and quickly.

Switch-Position Indicator — Photographs were used by J. G. Pollock, Heisley Coal Co., Nanty Glo, Pa., to show a track-switch position indicator used at the top of a rope-haulage main slope. Electric switches mounted on posts outside the rails and connected to the latches by tierods operate signal lights on the hoisting engineer's platform. A green light indicates normal position for outbound trips, with red for the correct position for trips operating in the opposite direction.

Sled Carries Drag to Prevent Damage to Rollers—Pictures illustrated the construction and use of a sled for supporting a trip drag and keeping it from damaging rope rollers and track submitted by "A conveyor worker" at the Rochester & Pittsburgh Coal Co., in Pennsylvania. The sled runs on the track rails and is attached to the last car in a trip by chains 2 to 3 ft. long.

If the trip begins to back up, the sled remains temporarily stationary, with the result that the drag slides over the back end to engage the ties. The flanged runners on the sled are made of angles with turned-up ends, which also are curved slightly toward the center of the track. Runners are approximately 10 in. high so that the cross members, which serve both as tie bars and a support for the drag, will clear the rollers.

Special Tool Cuts Trailing-Cable Jackets—Cutting the rubber jacket of a trailing cable speedily and without the possibility of injury either to the person, the conductor insulation or the cable stranding is the object of a tool designed by Howard Poland, section foreman, No. 2 mine, Pursglove Coal Mining Co., Pursglove, W. Va. The tool, as indicated in Fig. 11, showing it ready to make a longitudinal slit in the rubber jacket, consists of a tube with an internal blade, which is forced into cutting position by squeezing the shears-type handles. Pulling the tool along the cable completes the job. The shape of the knife is shown in Fig. 12.

Depth of the cut can be regulated by the distance the upper handle is pushed down. Total downward movement, however, is limited by a stop to approximately the thickness of the jacket of the particular type of cable for which the tool is designed. To make a circumferential cut, the blade is turned 90 deg., whereupon it locks in position. The handles then are squeezed while the tool is moved around the cable.

Improved Guard Rail for Panel and Room Track—An improved guard rail designed to

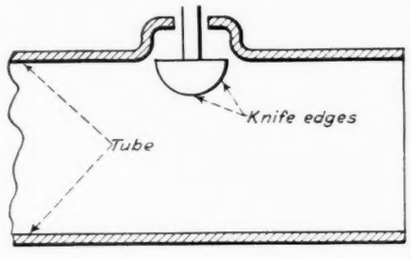
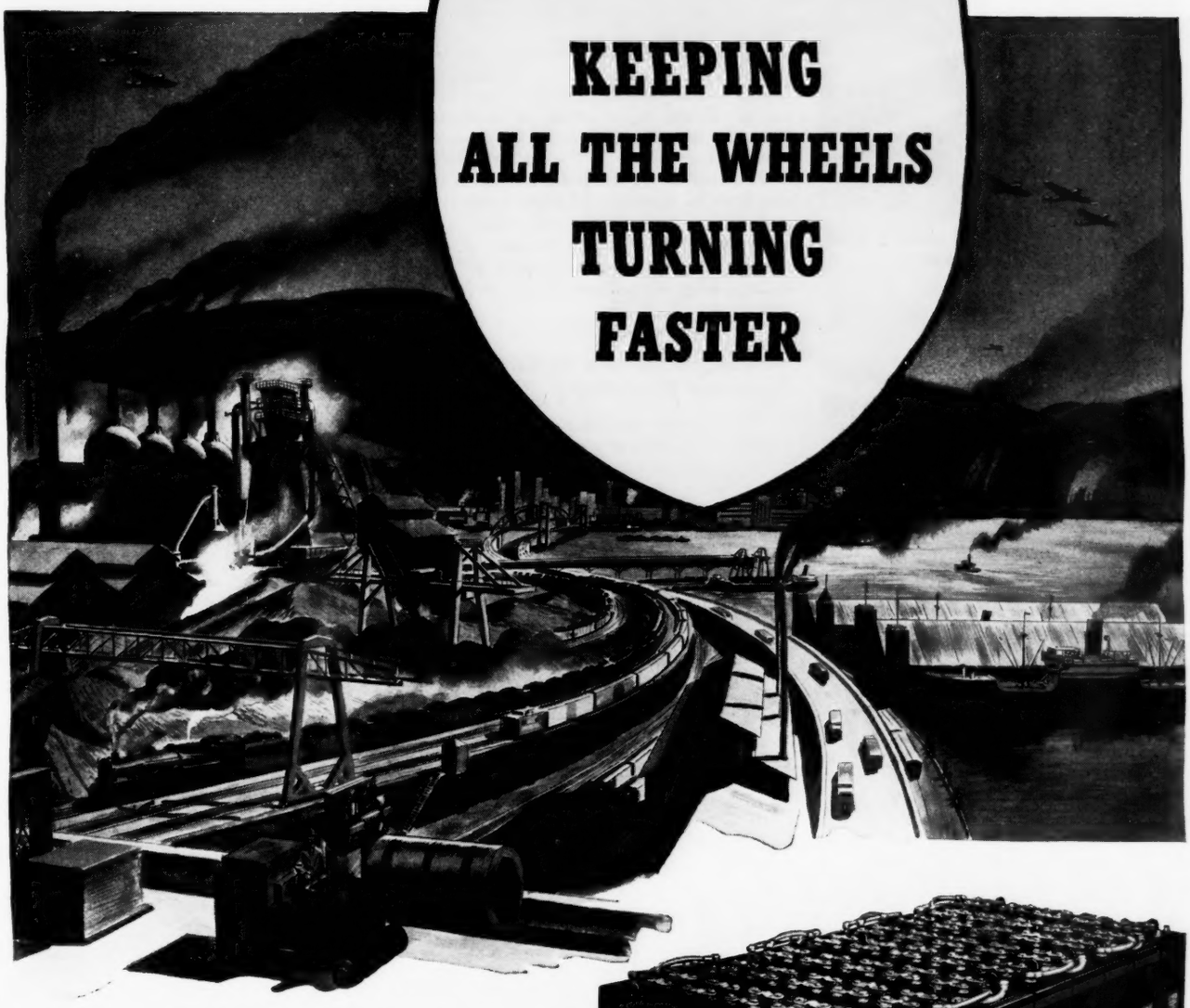


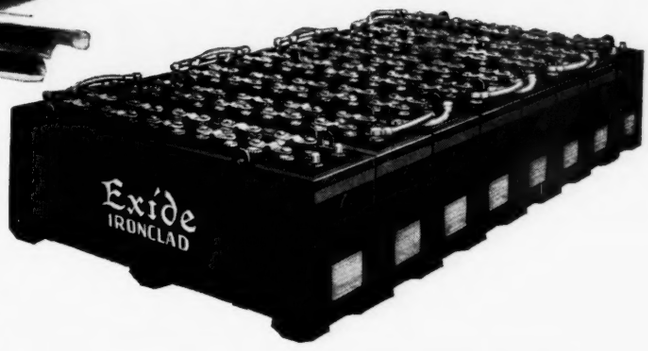
Fig. 12—The knife in the jacket-slitting tool has a compromise point for penetration and a taper edge for slitting.

Cash In!

Good ideas for saving money, increasing efficiency and promoting safety around the mines are never a drug on the market. Employers want them because an operating company stands or falls on the basis of how efficiently it can produce and rewards its personnel accordingly. Coal Age wants them to pass on to other operating, electrical, mechanical and safety men for the general good of the indusry. So cash in by sending in your kink, along wih a sketch or photo if it will help to make it clearer. For each acceptable idea, Coal Age will pay $5 or more on publication.

KEEPING ALL THE WHEELS TURNING FASTER





Exide-Ironclad Batteries underground help you feed more fuel to industry

A HEAVIER STREAM of coal moves faster from face to tipple to industry's furnaces, when your underground haulage system is running swift and smooth. Exide-Ironclad power in your locomotives keeps all wheels turning faster under today's heavier loads.

This is because Exide-Ironclad Batteries have tremendous power, which they deliver at a voltage that insures good motor speeds. In addition, they are so rugged that they stand up in the fastest, toughest service, giving no trouble, needing no repairs.

The proof is the way Exide-Ironclads outlive their guarantee, in the hands of mine operators everywhere. This is the type of dependability which enables you to take full advantage of Exide-Ironclad power in speeding up your own underground haulage service... safely and economically. Write for free booklet, "The Storage Battery Locomotive for Underground Haulage."

Exide
IRONCLAD
BATTERIES

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

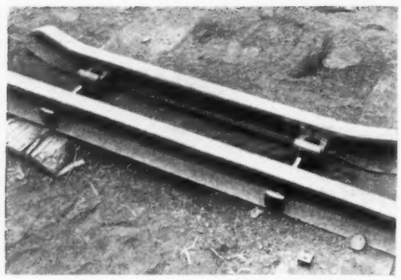


Fig. 13—View of guard rail showing spacer blocks welded in place.

Fig. 14—Guard rail in place, showing beveled end and washer.

promote safety and eliminate delays was submitted by William Guiney, mine manager, Bell & Zoller Coal & Mining Co., Zeigler, Ill., which has standardized on this type of guard for all 35-lb. rail applications.

Features of the guard rail shown in Fig. 13 include: spacer blocks welded to the guard rail to prevent loss in transit; block bolt holes on 24-in. centers, with an over-all guard-rail length of 48 in.; and $\frac{3}{4}$x5-in. bolts with $1\frac{1}{2}$-in.-square heads. These heads fit snugly between the base and the ball of the

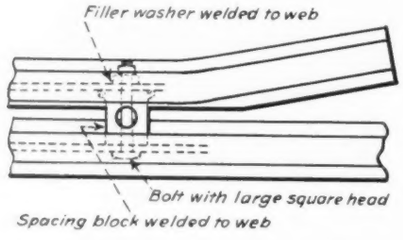


Fig. 15—Details of guard-rail construction.

rail and require only one wrench for installation.

Fig. 14 shows how a $1\frac{1}{2}$-in.-square washer is welded to the outside of the guard rail, making it easier to use a wrench on the nut, which thus is brought out flush with the edge of the rail head. The ends of the guard rail are beveled to facilitate the moving of loading machines with caterpillar treads over it.

•

Electrolytic Corrosion Stopped With Dry-Disk Rectifier

At small cost, metallic structures or equipment such as cables, pipes, tanks, conveyors, etc., can be protected from electrolytic corrosion by using a copper-oxide rectifier in series with a low-voltage a.c. supply. A bulletin, "Westinghouse Engineering Progress 1940," states that during the last two years many such rectifier installations have been made. Outstanding are those protecting pipe lines, telephone cables, foundations and water tanks.

Metal is eaten away only when it is the anode of a circuit: that is, when current leaves it and passes into water or any moist mass. If the metal object is a cathode, however, meaning that it is kept negative with respect to the wet earth or material, the current enters the metal and takes nothing from it. Corrosion of pipes inside mines and of top works pipes and tanks buried near the surface of the ground often is blamed on acid water or adverse soil conditions when electrolysis is the underlying reason.

•

Painting Distances on Ribs Promotes Efficiency

"Where places are being driven to develop a mine or a portion of a mine," writes George T. Fisher, Ronco, Pa., "there should be painted at the entrance to every entry, room or cut-through, as soon as a few cuts are taken out, the distance the place is to be driven. This aids the shotfirer in that he knows how far the place will be driven and about when it will shoot through. It also will aid the coal cutters because they will not want to cut or shear a place through when the mechanical-loading or drilling machine is in the adjoining place and thus subject the machines to damage or the persons to injury."

•

Metering for Second Mine Based on House Units

For metering the supply of another mine operating off his company's lines, Lyman Ellrick, electrical engineer, Hickory Grove Coal Mining Corporation, Sullivan, Ind., uses the set-up shown in the accompanying drawing. The system is of the 4-wire 3-phase type, 4,160/2,300 volts to ground.

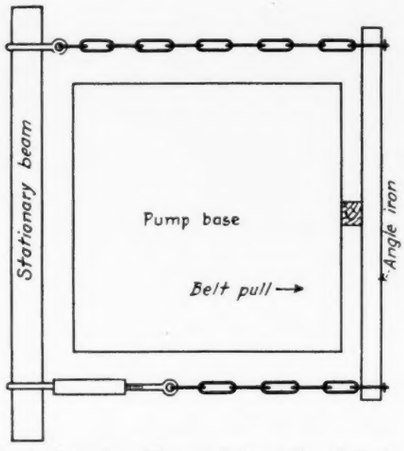
The meters are regular 5-amp. 110-volt units. The three readings are added and the total multiplied by 400 to give the total kilowatt-hours. The 2,300-volt system includes several single transformer installations, which unbalance the load. By using three meters, the readings reflect this unbalance.

•

Turnbuckle Adjusts Turbine Pump To Tighten Driving Belt

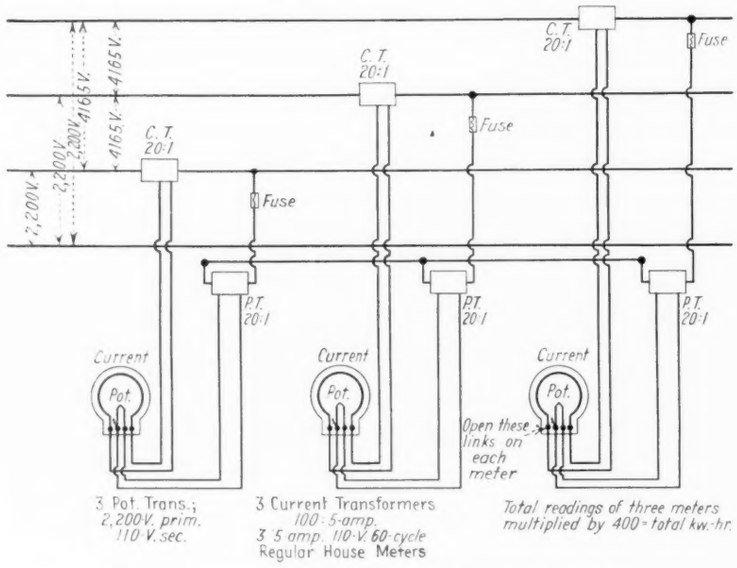
Moving a 1,400-g.p.m. 400-ft. deepwell turbine pump to tighten the flat driving belt is done by means of chains and a turnbuckle at a western Kentucky shaft mine. The pump is driven by a 150-hp. Chuse non-releasing "corliss-type" steam engine in a building 40 ft. from the shaft in which the Pomona unit is installed.

Belt width is 16 in. and its total length is 96 ft. Rough adjustment is made by

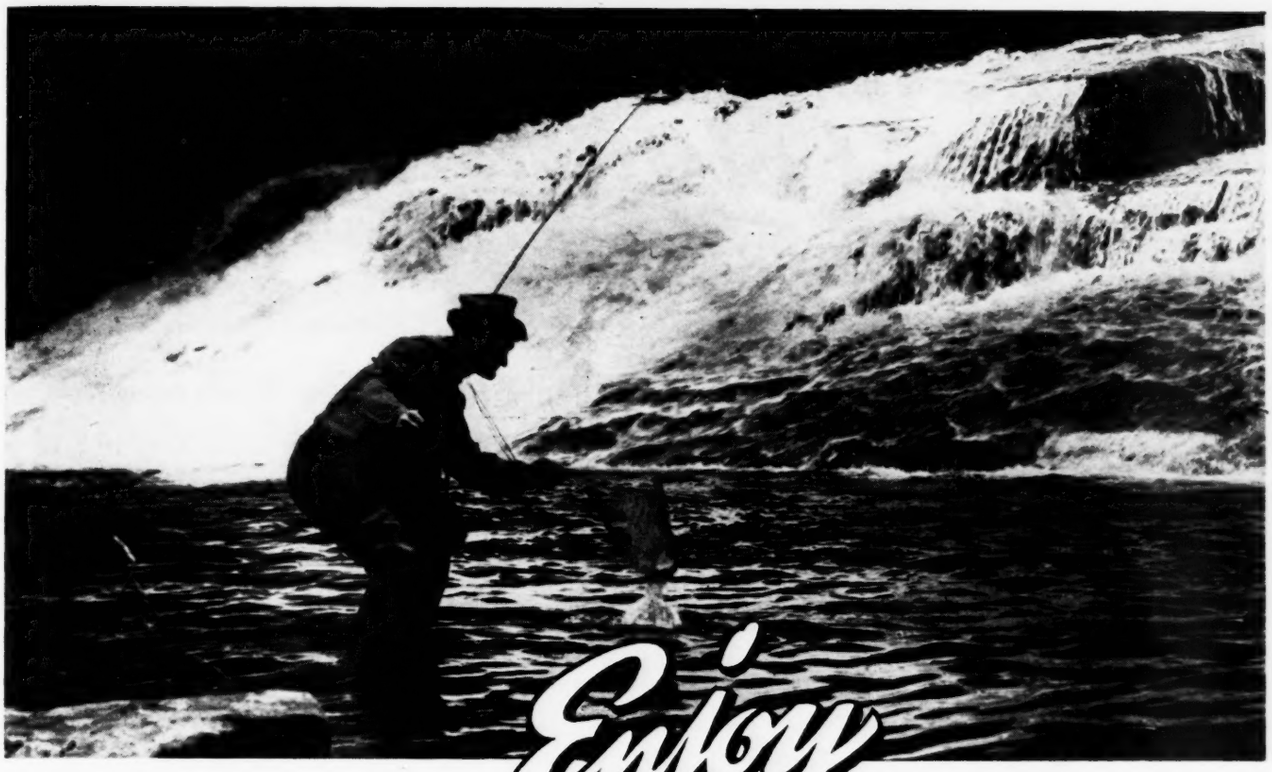


By hooking the different links of the chain to the angle iron and then adjusting the turnbuckle an 8-in. travel is secured.

hooking chain links to an angle-iron lever and then completing the adjustment by a $1\frac{1}{4}$-in. turnbuckle in the other chain. A small block of wood constitutes the pivot between the pump base and the angle-iron lever. This arrangement permits an 8-in. adjustment. The 10-in. casing of the pump



Set-up for metering 2,300-volt service off 4,160-volt system.



Enjoy

YOUR VACATION THIS SUMMER

Boy! the luxury of a *real* vacation right in the middle of peak production . . . and without a single production worry. Here's how it's done—

Make a tour of inspection around your tipple soon with a Morrow Engineer . . . check-up on the worn and replacement parts needed, figure where an alteration or addition will speed the handling of your coal, select a location for the new low-cost Morrow-Prins Coal Washer . . . then leave the details to him. Installation will be made without disrupting your schedule and you will have the complete satisfaction of *knowing* that your organization can handle every production requirement better and faster than ever before. It's easy the "Morrow-way," because you have only one negotiation—one responsibility.

Why not call in a Morrow Engineer soon . . . it's good vacation insurance and year 'round insurance of profitable production.

MORROW

MANUFACTURING CO. WELLSTON, OHIO

DESIGNERS AND BUILDERS OF COAL HANDLING EQUIPMENT FOR OVER 25 YEARS

Shaking Screens
Coal Washers
Car Hauls, Picking Tables
Loading Booms, Loading Chutes
Bins, Bin Gates

COMPLETE COAL TIPPLES AND COAL HANDLING EQUIPMENT

Elevating and Conveying Machinery
Sand and Gravel Screening and Washing Machinery

Car Retarders
Settling Tank, Grizzlies
Revolving Screens
Perforated Metal Screens
Flanged Lip Screen Plates

CINCINNATI
First Again
WITH THE STANEX!

. . . A REALLY SUCCESSFUL FACTORY-MADE BIT FOR ANY CHAIN USING ½" x 1" BITS!

★ **—THE STANEX BIT**

Patterned after the highly successful Cincinnati Duplex Bit, the new Stanex Bit is made by efficient, high production, factory methods resulting in low bit price. Light weight, too, makes the Stanex extremely desirable especially in conveyor mining where bit transportation is a problem.

★ **—THE STANEX MOUNTING**

The STANEX mounting, when installed in your present chain, will give you the strongest, longest lasting holder and quickest setting bit ever offered for chains using ½" x 1" bits.

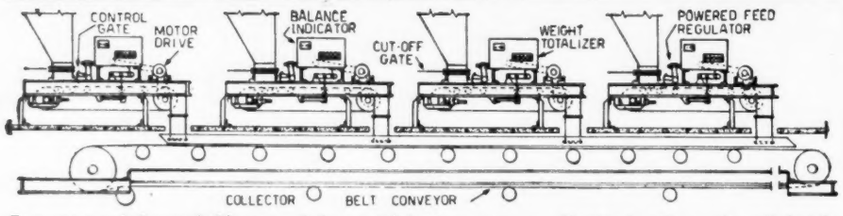
★ **—THE STANEX ASSEMBLY**

The shank of the holder is inserted into the ½" x 1" bit passage of the block where it is clamped by the set screw. The tapered front surface of the shank keeps the assembly tight . . . prevents bit and holder losses. Stanex Bits are quickly set . . . automatically gaged.

The STANEX is not intended to supplant the Cincinnati DUPLEX chain. For the ultimate in cutter chain performance use CINCINNATI CHAINS and DUPLEX BITS. Write to us concerning your coal cutting problems.

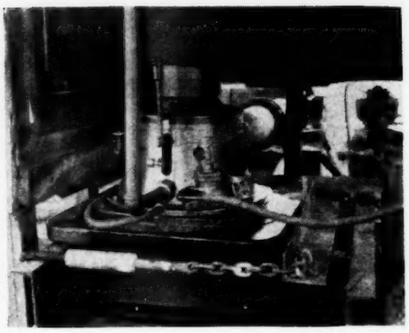
The CINCINNATI MINE MACHINERY Co.
SPRING GROVE & MEEKER STS. CINCINNATI, OHIO

FEEDOWEIGHT



For accurately weighing coal to a mixing conveyor—Controls the rate of feed and continuously totalizes the weight delivered

MERRICK SCALE M'FG. CO., Passaic, New Jersey



Belt-centers adjusting device for turbine pump with 16-in. flat-belt drive.

hangs free from a clamp 12 ft. below the driving head. This clamp slides along the supporting timbers when the driving-head position is changed to tighten the belt.

•

Screw Holes in Segments Reconditioned by Inserts

"When controller cylinders in either our locomotives or shortwalls become damaged as a result of the segment screw holes being burned out or the threads stripped," states H. W. McDowell, superintendent, Somers Coal Co., Adena, Ohio, "we drill them out and tap to ½ in. Then a piece of soft ½-in. brass rod is threaded into a hole and cut off flush, followed by drilling it and tapping to the original size and thread."

•

Sledge With Long Handle Straightens Flights

Much time may be saved in conveyor mining by keeping a sledge hammer with a handle as long as possible at the face to straighten bent flights, writes C. E. Jones, conveyor foreman, Kopperston, W. Va. Bent flights frequently result from sending supplies to the face, especially when the conveyor lines are long. Frequently, flights are bent so much that, unless other measures are taken, they must be removed, resulting in considerable loss of time. Or, in a number of cases, the crew assumes that they are not in too bad a condition to go through the line, with the result that the chain gets hung up when the crew's judgment is bad. This very often causes a delay of 30 to 45 minutes. Delays from these various causes are most prevalent, as a rule, where the line contains 40 or more pans, where the line was not bolted, or where the bolts were not put in tightly. As a general rule, most of the bad bending of flights is caused by sending pans and chain back.

"All this time can be saved by having sledge hammers at each face where supplies are sent back. The larger the hammer the better. A 16-lb. hammer is very satisfactory. The handle of the hammer should be as long as the height of the seam will permit. When supplies are taken off and a bent flight is seen the line is stopped. From five to ten licks with the hammer usually is all that is needed to make the flight straight."

WHAT'S NEW IN THE FIELD

Anthracite Wage Fight Settled; Union and Southern Soft-Coal Men Deadlocked

ANTHRACITE miners returned to work May 20 after a suspension of operations lasting one day—the shortest on record. The settlement, reached May 19, culminating conferences held at the Commodore Hotel, is for two years and provides for wage increases and a vacation payment. The agreement, which is retroactive to May 1, the date of expiration of the old contract, calls for a 7½ per cent wage increase payable until Oct. 1, 1941, when the increase is to be raised to 10 per cent. A token payment of $20 for each person employed in the industry a year or more is to be made to cover vacation expenses. The first payment will be made at Christmas this year; thereafter it will be given at each vacation period.

When the wage increase reaches 10 per cent, in October, it will represent a rise of about 60c. a day for day workers and 75c. for contract miners, the first increase granted to anthracite workers since 1923. The U.M.W. originally demanded an increase of $1 a day for day men and 20 per cent for contract employees. Formal settlement of the conflict came with initialling of the agreement by W. W. Inglis, president of the Glen Alden Coal Co. and chairman of the joint conference, and John L. Lewis, president of the United Mine Workers. Philip Murray, vice president, and Thomas Kennedy, secretary-treasurer of the union, also signed it. Ratification by the rank and file of the union is regarded as certain.

Soft-Coal Conferees Deadlocked

The deadlock in negotiations between southern Appalachian bituminous operators and the union, however, is no nearer settlement as *Coal Age* goes to press than at the resumption of sessions on May 12. The conference at the Biltmore Hotel broke up May 21 amid bitter recriminations and the threat of another suspension. The conferees appeared before the National Defense Mediation Board in Washington on May 23 in an effort to bring about accord. At this meeting the threat of another suspension of mining was deferred by a promise of John L. Lewis to maintain the "status quo" a few days longer.

The bitterness that has marked the conferences was accentuated by the appearance of an advertisement in the morning newspapers signed by the Southern Coal Operators' Wage Conference, consisting of the 13 coal-producer associations affected, charging John L. Lewis with aiming to make himself "dictator of the country" and maintaining that the agreement sought by the union would place the coal industry under Mr. Lewis's control.

The agreement has been approved by the operators of the northern Appalachian region and outlying districts in the West and Middle West and now is in operation. The Southern fields have been operating since May 1, when the recent stoppage was terminated, on a tentative basis, providing for an increase of $1 a day in the basic wage rate, leaving it still 40c. less than that in effect in the North.

The conference broken off had as its objective a permanent agreement corresponding to that in the North and including elimination of the 40c. wage differential prevailing in the South, as well as rectification of certain working conditions, notably abolition of the "reject" clause under which miners are penalized for dirty coal.

Mr. Lewis let it be known May 20, when the Northern operators approved the agreement with the union, that the Southern owners would have to accept the agreement in every detail if their mines were to continue to operate.

"They will have to sign on the dotted line," he declared. "We hope this will come to pass without public inconvenience, but come to pass it will."

Charles O'Neill, spokesman for the Northern operators, accepted the agreement in their behalf by characterizing it as fair and in no way impinging upon the rights of management. He also supported the union's demands for removal of the Southern wage differential, abolition of the reject clause, and paid vacations.

Mr. Lewis would make no reply to the charges made by the Southern operators in their advertisement, but a statement commenting on the advertisement was issued by K. C. Adams in behalf of the United Mine Workers. "John L. Lewis, the intended victim of the advertisement," the union declared, "prefers to pursue a course of analyzing the facts involved before the United States Mediation Board on Friday next. It just so happens that this board has at hand practically all the facts and production costs involved in the economic understanding of the issues concerned, and it was upon this information that the selfsame operators were judged guilty of asinine economic thinking. The public record of the findings of Congressional investigations, of private research and every inves-

Wide World Photo

Agreement Reached in Anthracite Wage Conference

Negotiators for the United Mine Workers and the anthracite operators came to an agreement on May 12 that ended the one-day suspension of work by Pennsylvania hard-coal miners. Left to right—Philip Murray, president, Congress of Industrial Organizations; Martin F. Brennan, president of District 9, U.M.W.; Thomas Kennedy, secretary-treasurer, U.M.W.; John Boylan, secretary, Anthracite Board of Conciliation, and secretary of the joint conference; John L. Lewis, president, U.M.W.; W. W. Inglis, chairman of the joint conference and president of the Glen Alden Coal Co.; R. E. Taggart, president, Philadelphia & Reading Coal & Iron Co.; J. H. Pierce, president, Bear Ridge Colliery Co.

tigating agency that has ever penetrated the kingdom of these mock patriots belies their self-advertised story of fair play and square dealing."

The Illinois Coal Producers' Association and the Progressive Mine Workers (American Federation of Labor) reached a temporary working agreement May 12 affecting about 12,000 miners in Illinois soft-coal fields. The agreement, made retroactive to April 1, provided for wage increases ranging as high as $1.40 a day and is effective until a permanent pact governing working conditions in the Appalachian fields is reached. A permanent agreement for Illinois fields will be negotiated when the Eastern pact is signed.

The Republic Steel Corporation and the United Mine Workers reached an agreement May 10 for reopening of the concern's Alabama coal mines May 12. Republic employs about 1,500 miners, who supply fuel for the company's plants in Birmingham and Gadsden. The new contract provides a basic wage increase of $1 a day.

Negotiations between the union and the Woodward Iron Co. and Tennessee Coal, Iron & Railroad Co. were still in preliminary stages.

•

Defense Advisory Commission Advises on Car Policy

The National Defense Advisory Commission on April 30 adopted the following policy: To make the most efficient use of car capacity, all shippers and receivers of freight were advised to keep daily check of their operations to see that the following plan is carried out in so far as possible under existing conditions:

(1) Give advance notice of requirements but do not order cars placed for loading until commodities are ready to load; (2) unload cars promptly on arrival and notify railroad when empty car is available; (3) load cars to maximum journal carrying capacity or full visible capacity, whichever governs; (4) remove all dunnage, blocking and rubbish from cars after unloading to permit immediate reuse and eliminate necessity of delay to cars for reconditioning; (5) in industries where five-day work week is in effect some plan should be worked out to provide at least six-day basis for loading and unloading cars.

Shippers and receivers of freight, says the commission, can make a large contribution to our defense effort by carrying out the suggestions above given, and it urges prompt and effective compliance therewith.

•

Nicholas County Firm Set Up

The Nicholas Webster Coal Corporation, of Richwood, W. Va., with chief operations in Nicholas County, was chartered on May 6. The corporation, with an authorized capital of $50,000, was incorporated by Thomas T. Rees, formerly with the Lillybrook Coal Co.; P. C. Thomas, vice president, Koppers Coal Co., and J. Ray Maust, president, Maust Coal & Coke Corporation, New York.

First Aid, Engineering and Coal Preparation Feature Indiana Institute Meeting

FIRST AID and mine safety, the application of engineering principles to mine development and operation, and coal preparation were the subjects of the 1941 summer meeting of the Indiana Coal Mining Institute, held at the Hotel Vendome, Evansville, Ind., May 17. Presiding at the technical sessions was H. A. Cross, general superintendent, Walter Bledsoe & Co., Terre Haute, Ind., and institute president. Speaker of the evening at the banquet was W. P. Allyn, Indiana State Teachers' College.

The award of certificates to 17 men who have completed the training course in mining subjects offered by the Indiana Department of Vocational Education, and who hold the necessary U. S. Bureau of Mines certificates in first-aid and mine-rescue, was a feature of the banquet session. In presenting the certificates, Kirk V. Cammack, instructor, pointed out that they were the result of a program carried out over the last three years to meet the need for more men with technical knowledge to handle the problems growing out of mechanical mining. Over 1,000 men have completed the work in one or more units, but the 17 honored at the banquet are the only ones to date to have completed the entire course. Frank Ralston, foreman, Snow Hill Coal Corporation, Terre Haute, Ind., who was unable to be present, was singled out to receive an engraved Koehler flame safety lamp for making the highest grade of those to complete the full course.

Over a Million Equipped

Since its organization in 1910, the Bureau of Mines has issued over a million first-aid certificates to men in the mineral industries, declared P. P. Senio, assistant safety instructor, Vincennes (Ind.) station. In the fiscal year ended June 30, 1940, however, only 155 certificates were awarded in Indiana. "Just why there is such a small amount of first-aid training being done in the coal fields of Indiana, I am not prepared to say. Many of you have at least been exposed to first-aid training at some time or other and may remember some of the fundamentals that would enable you to be of some assistance in time of an emergency, but perhaps you have not realized the potential value of first-aid training as a part of your safety program.

"The value of first-aid training is twofold. First of all there is, of course, the value of the application of first-aid at the time of the injury." The second value has been found to lie in the fact "that the men who had received first-aid training were not being injured as frequently or as severely as those who had not received the training."

But while such training tends to make a man a safer workman, it cannot be expected to effect a permanent reduction in the accident rate. Unless the course is repeated from time to time the lessons lose their value. And while first-aid has a definite and important place in the safety program at a mine, it "can never be a substitute for adequate supervision or the enforcement of rules governing the safe conduct of the various phases of mine operation. It can, however, by building up a spirit of safety consciousness, make men more amenable to safety rules or safety orders.

More Needed Than First Aid

"First-aid training can never make unsafe blasting practices safe, nor protect against the hazards of fine coal dust, inadequate ventilation or loose and unsupported roof. If we are to make real headway in reducing mine accidents we must have a well-thought-

Keeping Step With Coal Demand

Bituminous Coal Stocks

	Thousands Net Tons April 1 1941	P. C. Change From March 1 1941	P. C. Change From April 1 1940
Electric power utilities	11,294	+ 3.19	+ 22.00
Byproduct coke ovens	9,854	— 0.36	+ 85.75
Steel and rolling mills	1,276	+22.57	+120.76
Railroads (Class 1)	8,738	+21.10	+ 87.51
Other industrials*.	14,392	+ 7.18	+ 38.26
Total	45,554	+ 7.13	+ 50.77

Bituminous Coal Consumption

	Thousands Net Tons March 1941	P. C. Change From Feb. 1941	P. C. Change From March 1940
Electric power utilities	4,760	+ 7.06	+18.14
Byproduct coke ovens	7,157	+11.05	+22.76
Steel and rolling mills	1,024	+ 6.00	+17.70
Railroads (Class 1)	8,609	+12.30	+18.12
Other industrials*.	12,528	+ 7.65	+19.08
Total	34,078	+ 9.36	+19.41

* Includes beehive ovens, coal-gas retorts and cement mills.

Coal Production

Bituminous

Month of April, 1941, net tons.	6,266,000
Per cent dec. from April, 1940.	80.89
January-April, 1941, net tons...	140,281,000
P.c. dec. from Jan.-April, 1940.	7.88

Anthracite

Month of April, 1941, net tons.	3,203,000
Per cent dec. from April, 1940.	14.49
January-April, 1941, net tons..	17,207,000
P.c. inc. over Jan.-April, 1940..	3.11

Sales of Domestic Coal Stokers Vs. Oil Burners

Sales	Coal Stokers	Oil Burners
March, 1941	9,710	12,038
P.c. increase over March, 1940	123.63	31.27
January-March, 1941.	18,990	33,701
P.c. inc. over Jan.-March, 1940	70.51	22.08

Index of Business Activity*

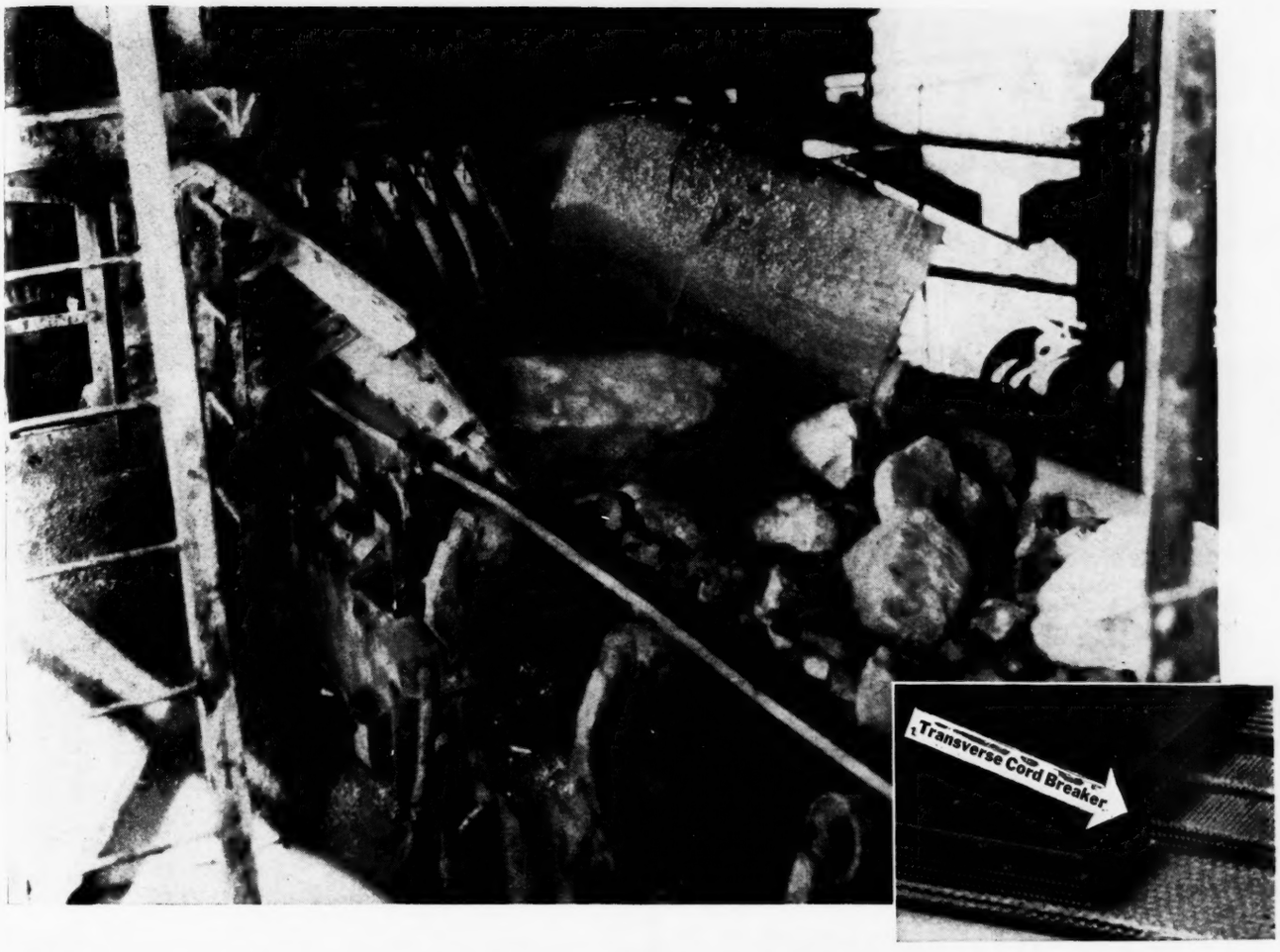
Latest week	142.7
Per cent change from month ago.	+ 3.40
Per cent change from year ago...	+ 30.80

* *Business Week*, May 17.

Electrical Power Output†

Week ended May 10, kw.-hr...	2,791,609,000
P.c. change from month ago..	+ 2.56
P.c. change from year ago....	+16.92

† Edison Electric Institute.



More about the Goodrich cushion for a 600-pound smash

YOU coal men can sympathize with the men in an ore unloading plant on Lake Erie—when they saw iron ore coming off the Lakes in the biggest lumps in years. Huge chunks of 600, 700 pounds, they broke parts off the steel hoppers and feed chutes. Then they had to drop 7 feet from feeder to moving conveyor belt.

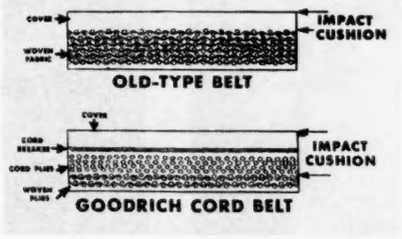
If the lumps broke heavy steel, what would they do to the conveyor belts? The answer is—nothing. After a record-breaking season the belts are still performing like new. They are Goodrich Cord Conveyor Belts, with a special, revolutionary new design for just such punishment.

Goodrich principle increases impact resistance 4 times

In the Goodrich Cord Belt all plies except those nearest the pulley are of individual parallel cords surrounded by rubber. These plies have practically the same resistance to impact as the cover itself, and resistance to impact increases as the square of the increase in cover thickness.

Belt life increased in every service

Even if impact is not a worry in your operation, Goodrich Cord Belts will



give you longer service—in some cases the increased life has been 10 times! One chief reason is the Goodrich transverse cord breaker above the carcass, which tends to keep gouges from the carcass, increases adhesion, and prevents the rubber in the cover from being distorted beyond its elastic limit.

Many other important advantages

In Goodrich Cord Conveyor Belts ply separation is unknown, all danger of flexing failure is ended, the belt is practically stretchless, and perfect troughing is assured. These belts can be spliced on the job and can even be joined with metal fasteners under certain conditions.

Goodrich Cord Belts are setting new records of long life, low cost per ton in hundreds of installations—sometimes giving 10 times the life of any former belt. Send for fully descriptive folder. It shows you why this belt lasts longer, cuts costs. *The B. F. Goodrich Company, Mechanical Goods Division, Akron, Ohio.*

B.F. Goodrich
First IN RUBBER

(*Another story of Goodrich development work appears on page 1*)

INDIANA INSTITUTE MEETING

Part of the group receiving certificates on completion of the mine training course. In front row, left to right, are: John R. Williamson, American No. 2 mine, Knox Consolidated Coal Corporation; William L. Day, American No. 1; George S. Fielder, North Mining Co.; Edwin Boxley, American No. 2; and Charles M. Shake, Dresser mine, Walter Bledsoe & Co. In rear row are: Kirk V. Cammack, instructor; Morgan Farley, Enos Coal Mining Co.; George Sermersheim, Kings mine, Princeton Mining Co.; Ray Williams, Kings mine; Tim O'Connor, Snow Hill Coal Corporation; Ray McCarty, Dresser; and Leonard Francis, Saxton mine, Walter Bledsoe & Co. Not present for the photo were: Jack Cain, Dresser; Harvey Thomas, Dresser; Frank Ralston, Snow Hill; Clem McClure, Baker mine, Templeton Coal Co.; Herman Haupt, Peerless mine, Templeton Coal Co.; and Walter Ross, Heim Coal Co.

Klaas Prins (left), who discussed coal preparation, chats with H. A. Cross, institute president.

D. W. Hayes, superintendent, Clinton Coal Co., greets a hidden friend, while H. A. Keenan, superintendent, Templeton Coal Co., cuts his eye at the Coal Age camera.

In a get-together spirit are Logan Hutchison, inside foreman, Kings mine; Mack Moss, superintendent, Binkley Mining Co.; and Carl Donie, superintendent, and W. D. Roof, office manager, Little Betty Mining Corporation.

Tim O'Connor (left) helps Fred Bieler, superintendent, Snow Hill Coal Corporation, pass the time before his discussion of coal preparation.

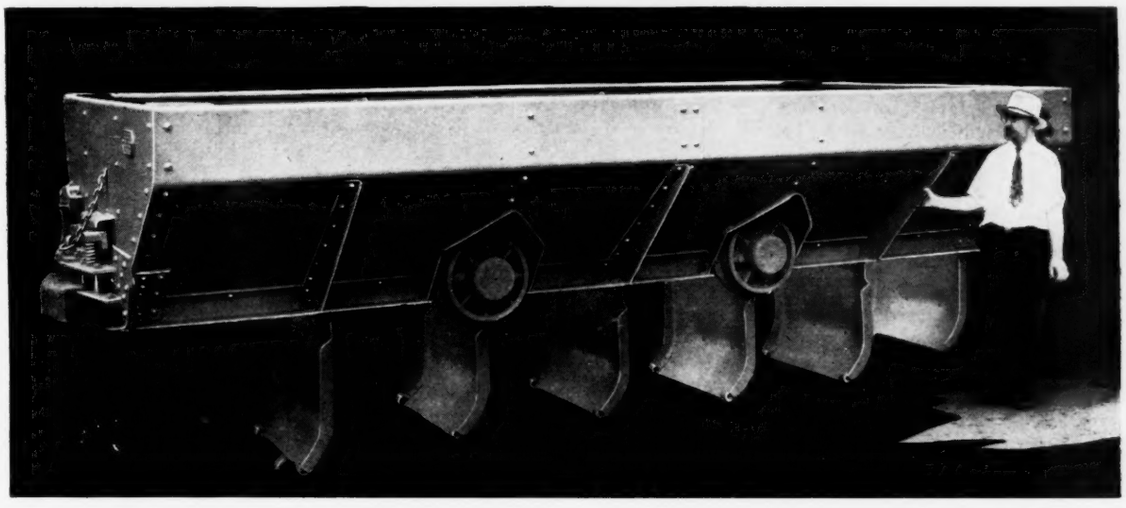
Engineering and mine operation were their subjects. Left, R. C. Everson, mining engineer, with D. W. Jones, superintendent, and George Guiney, foreman, Kings mine.

William Cunningham, general superintendent, Linton - Summit Coal Co., led safety discussion.

Walter Buss, engineer, Knox Consolidated Coal Corporation, casts a considering eye on proceedings.

P. P. Senio (on chair arm) relaxes with Ed Broadhurst, Dresser mine, and Arthur Higginbotham, Kings mine.

Man, this is no time to QUIBBLE --we want PRODUCTION!



• Right! But while you're going after increased production, don't stub your toe on increased costs. The operator who walks the floor and pulls his hair because of low production and high mine car maintenance costs seldom finds relief in just buying new cars. The answer isn't in new cars alone . . . it's the type of car you buy. And we're not quibbling; we're giving you facts—proven facts —when we say that only S-D 1-2-3 "Automatics" can give you the required production with so few cars to keep up with today's demands of the industry, and at savings you can't afford to pass up. In small mines and large mines, changing over to S-D "Automatics" has effected savings that will, without a doubt, amaze you. Ask us about them.

Did you see the photo on front cover of Coal Age, May issue? It's worth seeing . . . it's the S-D 1-2-3 ten ton "Automatic" transfer car shown in this ad. Did you read the story in the same issue stating that these cars were increasing the loader output more than 20 per cent in the King's mine of the Princeton Mining Co? Princeton's "head men" have been on their toes—no quibbling there—the combination of their progressiveness and our new S-D 1-2-3 "Automatics", equipped with S-D "Floater" Ball Bearing Wheels, is whipping an old problem with a minimum investment and with astonishingly satisfactory results.

Read the story; perhaps S-D Automatic Transfer Cars are the answer to increased production of your loading machines. Ask us about it . . . we won't quibble. You can depend on us for facts and figures of cases which, no doubt, parallel yours. Sanford-Day Iron Works, 161 Dale, Knoxville, Tenn.

NOTE . . . Sanford-Day backs its claims on savings with S-D "Automatics" by offering you the use of these cars on a Liberal Rental Plan. You pay only on a tonnage-hauled basis, and your savings will more than pay the rentals. If you're skeptical, you're just the man we want to talk to.

SANFORD-DAY

MINE CARS, ALL TYPES
TRAILERS · WHEELS · SHEAVES

out and comprehensive safety program that is at work every day in the year. In this program, first-aid training will no doubt play an important part."

Harking back to the early days of first-aid training in Indiana, notable by the holding of the first State meet at Linton about 1910, followed shortly after by a national meet at Terre Haute, in which his team took fourth place, William Cunningham, general superintendent, Linton-Summit Coal Co., echoed Mr. Senio's contention that first-aid training and safety go hand in hand. Stating that the miners are glad to participate when given the right leadership, Mr. Cunningham observed that progress in training and safety is hampered because superintendents and bosses are prone to be lax in interest and participation. More training and more teams are a necessity.

Plan Mine for Future

Orderly and efficient operation—meaning low-cost coal—requires a definite working plan laid out with an eye to both the present and the future, contended Ralph C. Everson, mining engineer, Terre Haute, in a discussion of underground engineering planning. Such planning should start with the purchase of the coal rights, although it often is passed by without much consideration. It is essential for efficient operation over the life of the property that careful study be given to the problem of coordinating surface layout and shaft location, including provisions for future additions if they should be required.

In the early days, mines frequently were operated without the benefit of any engineering advice, which resulted in attempts to work out entire properties with two-heading main entries, haphazard turning of room entries, wide variations in room depths and thicknesses of room and barrier pillars, crooked entries, poor track layouts and bad ventilation. The surveyor or engineer came to the mine only once or twice a year and then only to make a record of what had been done in those parts of the workings he was able to get into.

Cannot Recover Wasted Coal

"With the introduction of more modern mining machinery and the finer preparation of coal at the mine, more attention is being paid to plans laid out by the engineer. When an organization invests its funds in a project it has a right to expect a fair return on its investment over a considerable period of time, which return is governed by the quantity of coal recovered per acre. Therefore, an effort should be made to recover as much coal as possible along the ribs, in breakthroughs, spillage, and coal in other slightly inaccessible places. This at times seems a little inconvenient and more expensive than working in the face, but if this coal is passed by it never will be recovered, thus materially reducing the percentage of the expected fair return per acre.

"An engineer must consider what the future demands will be for any particular project, as well as its present needs." Thus, where main entries are to be long, two headings usually will be found insufficient to carry the air and provide the necessary haulage roads. Four headings per main entry permit using two as aircourses and two as haulage roads. The pillars between the two pairs should not be broken any oftener than necessary, thereby improving ventilation by reducing air losses, while at the same time cutting the cost of stoppings materially. However, it will not eliminate as many doors on haulage roads as driving six-heading entries. In most cases, mains should be made up of at least four headings, although, "if conditions are bad, it is better to have two straight entries properly timbered and maintained than to have four or even six entries that are full or nearly full of falls and poorly maintained."

Haulage headings should be as straight as possible and their profiles determined to guide the necessary grading, as "coal cannot be hauled economically over dirty, kinky, poorly constructed and poorly graded haulage roads." Proper engineering also reduces maintenance on the road itself and on the rolling stock. And to maintain speed of operation, it is advisable to have the engineer locate all frogs and lay out all curves.

Two headings usually are enough for room entries, which should not be too long. Usually, conditions will necessitate a variation from mine to mine in a district or even within a single mine, but as far as possible the area to be depleted by room sections should be as constant as conditions will permit. "In making a general entry plan or even a room-section development plan I find it very desirable to calculate and estimate the location of the development in a series of fixed dates or operating days." With a room-development plan laid out in 20-shift periods, for example, with an estimate of the material and equipment necessary to operate the section at each period, "one can plan, provide for, and have the material and equipment available at the time it is needed in any particular part of the operation."

Leading the discussion, D. W. Jones, superintendent, Kings mine, Princeton Mining Co., Princeton, Ind., called on Mr. Everson for a series of charts showing a typical room panel development plan drawn up on the basis of 20-shift periods, with the material required for each stage, and asked George Guiney, foreman at Kings, to act as narrator in the showing of a series of slides depicting underground and surface operations, including the use of big cars and transfer stations (May *Coal Age*, p. 47).

In the old days, commented Mr. Jones, all the engineer did was furnish a map, or a record of what had been done. With mechanical mining, however, engineering must come first and must be directed to developments at least six months or a year in the future. Definite planning is an absolute necessity if the management is to get full output when it is needed. Setting up room work on a 20-shift basis, among other things, will materially reduce track expense by conserving time, reducing the quantity of material in service, and preventing loss.

Size Uniformity Demanded

"An increasing demand for a product uniform in size as well as in quality is responsible for the development of equipment to produce a fuel to meet the specifications of the coal consumer," declared Klaas Prins, coal-preparation engineer, Templeton-Mathews Corporation, Terre Haute, Ind. "The object of the various coal-cleaning devices is to separate the free impurities from the raw coal produced, thereby making this a better fuel with less ash and sulphur." The operation, in general terms, consists of wet washing or dry cleaning.

"It must be observed that although the selection of a cleaning process will fix the design of a plant to a certain extent, there are numerous very important matters which must receive careful consideration" if the plant is to be a success. If wet washing is adopted, an adequate supply of water is essential. In building a washing plant, the ultimate purpose of producing a coal uniform in size and quality must always be kept in mind. "It is imperative to know the mining method, system of cutting and loading and the possible interruptions in the supply of coal to the shaft or slope; also, the variation in the coal seam" with respect to impurities present. In a new development, such data may be difficult to obtain, but if the design is made without the necessary information, the equipment selected may be "too large or too small. . . . Experience has proved that often too little attention was paid to these simple things."

Preparation More Complex

Present market conditions necessitate elaborate preparation facilities. "Mixing, crushing, screening and drying are all-important in the production of marketable coal. Intricate conveying systems are necessary in modern preparation plants. Facilities for oiling the coal and testing laboratories often are provided." A steady flow of coal is

Coming Meetings

- American Society of Mechanical Engineers: semi-annual meeting, June 16-20, Kansas City, Mo.
- West Virginia Coal Mining Institute: annual summer meeting, June 20, Pritchard Hotel, Huntington, W. Va.
- American Retail Coal Association: second interstate conference on coal and seventh annual meeting, June 23, Morrison Hotel, Chicago.
- American Society for Testing Materials: 44th annual meeting, June 23-27, Palmer House, Chicago.
- Mining Society of Nova Scotia: annual meeting, June 24 and 25, Pictou Lodge, Pictou, N. S., Canada.
- Rocky Mountain Coal Mining Institute: annual meeting, June 26-28, Cosmopolitan Hotel, Denver, Colo.
- American Institute of Mining and Metallurgical Engineers: joint meeting of Central Appalachian section and Coal Division, June 27, White Sulphur Springs, W. Va.
- Southern Wyoming Coal Operators' Association: annual meeting, July 8, Cheyenne, Wyo.
- National Safety Council: 30th National Safety Congress and Exposition, Oct. 6-10, Stevens Hotel, Chicago, Ill.
- Fifth annual joint Fuels Conference under auspices of Coal Division of A.I.M.E. and Fuels Division of A.S.M.E., Oct. 30 and 31, Hotel Easton, Easton, Pa.

2-footed dragline WALKS to WORK...

and works with Purple Strand

THIS big stripping dragline waddles through the coal fields on two abrasive-resistant steel feet . . . squats down on a steel base and gobbles overburden. Here's why Bethlehem Purple Strand is used as dragline on this walking coal stripper.

Purple Strand delivers consistently long average service. It's made of 100 per cent Improved Plow Steel—the strongest, toughest rope steel made. The core . . . the wires . . . the strands are each specially lubricated to protect Purple Strand against internal abrasion and rust. Every detail in making the rope—from ore to shipping reel—is controlled by Bethlehem engineers. This way, the quality of every rope is held to uniformly high standards.

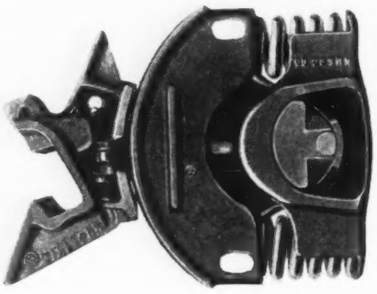
Next time you buy mine rope—dragline, tugger hoist rope, shaft rope, or shovel rope—specify Bethlehem Purple Strand. It's available in all standard sizes and constructions, with hemp center or IWRC.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY

SAFETY and EFFICIENCY IN MECHANIZED MINING } *Means* **WILLISON AUTOMATIC COUPLERS**

. . . for your new high capacity mine cars and locomotives

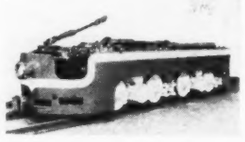


● The present trend toward complete mechanized mining dictates the use of higher capacity mine cars and locomotives that must be handled rapidly and safely . . . WILLISON Automatic Couplers are specially designed to meet the requirements of modern mechanized mining . . . Rotary dumping of cars without uncoupling is easily and safely accomplished with WILLISON Automatic Couplers.

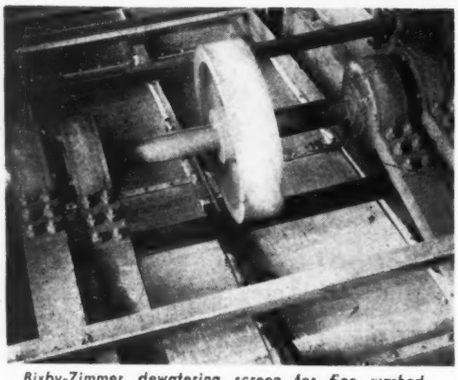
Write for Circular No. 5240 for full information on WILLISON Automatic Mine Car Couplers.

NATIONAL MALLEABLE & STEEL CASTINGS CO.

CLEVELAND, OHIO



***Years of Practical Experience built these* DEWATERING SCREENS**



Bixby-Zimmer dewatering screen for fine washed coal in preparation plant of Southwestern Illinois Coal Corporation. Other installations in Southern Illinois include such producers as Chicago, Wilmington & Franklin, Peabody, Pyramid, Sahara, Truax-Traer and United Electric.

Many Southern Illinois Producers are satisfied Users of BIXBY-ZIMMER SCREENS

You eliminate the frequent costly replacements when you use B-Z Screens because their rugged construction guarantees longer life through the use of abrasive resisting materials of maximum hardness with no distortion or binding in assembly. All welded joints insure built-in tension requiring minimum amount of fastenings for quick installation.

These tailor-made screens—tailored to fit your plant and condition—are *non-clogging* and give positive permanent sizing. B-Z screens assure you a longer life as screen openings are maintained even though rods are 50 per cent worn away.

It's an all-American product, backed by sound engineering and plant facilities for quick delivery.

WRITE TODAY for this bulletin which will give you all details on construction and sizes and why B-Z screens can be tailored-made to solve your dewatering problem.

BIXBY-ZIMMER ENGINEERING CO.

961 Abingdon St.

GALESBURG ILLINOIS

necessary for most efficient operation, and "in every coal producing plant, somewhere between the mine bottom and the cleaning unit there should be a means of regulating the flow of coal to avoid overloading and idling."

A few years ago, attempts were made to clean sizes up to 8 in. in Baum-type jigs. However, this method "was found to be costly and inefficient." To obtain a clean product it was necessary to wash at a low gravity, resulting in much coal going in the refuse or to the middlings crusher. Washing at a higher gravity "resulted in a very unsatisfactory clean product" and necessitated picking the washed coal in a number of cases.

Stoker Coal Sets Standards

Screening is a subject for lively discussion around the mines, particularly from the standpoint of size and screen area. Even more stress has been placed on this subject by the increasing demands for stoker coal. In the case of shaker screens, "efficient results were obtained" by designing on the basis that the tonnage which 1 sq.ft. of screen surface will pass in an hour is equal to the diameter of the perforations in inches. In other words, if the perforation diameter is 2 in., the screen will pass 2 tons of coal per square foot per hour.

High-speed vibrating screens have been installed in increasing numbers in recent years for dewatering and sizing, although the Parrish-type shaker still is a useful implement with a number of advantages in dewatering and sizing washed coal down to ¼ in. The rule given above applies also to this type of equipment.

"The preparation of stoker coal demands a lot of attention, and to cover this fully would require a special study, since it involves crushing, blending, oiling, etc." Vibrating screens frequently are used, again bringing up the question of screen capacities. "We have found a simple rule for determining the screening area of such equipment. It is advisable, however, in following this rule, to consult the screen manufacturer, as the screen analysis may differ and the motion of the screen and inclination are to be considered. We found that under average conditions the screening capacity per hour of 1 sq.ft. of screen surface, in tons, is equal to three times the opening of the screen cloth expressed in inches. . . . We have checked a number of recommendations given by screen manufacturers for certain screening problems, especially where stoker coal was produced by crushing nut, egg and lump coal, and have found this rule to apply very closely."

Use Sound Factors in Design

Maintenance of product quality in the coal industry starts at the working face and continues through the preparation plant and the sales department and eventually takes in last, but not least, the customer, declared Fred Bieler, superintendent, Snow Hill Coal Corporation, Terre Haute, Ind. "Since each coal seam has its own peculiarities, the control of the preparation plant must be determined by sound engineering principles in order to manufacture a product uniform in ash and uniform as to gradation of sizes."

Although, as he is not directly in touch with the market, the average underground

"HERE'S HOW"...

To Get Better Service from the Wire Rope You Use—

Assuming that you have bought and have had delivered to you the size, grade and construction of wire rope suitable for your work and equipment, the actual service you obtain from that rope—regardless of what the rope is capable of doing—will depend largely upon the following:

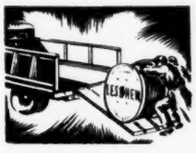
(1) *How the rope is handled from the time it is received until it is installed.*

(2) *The condition of the equipment on which the rope is to work, at time of installation.*

And here are some "Dos" and "Don'ts" that should prove valuable.

•1•

Right — *Wrong*



Reels and coils of wire rope should not be dropped from car or truck when being unloaded.

If iron bars are used to move reel, prying should be done under the reel flange and not against the rope.

If rope is not put into service when received, see that it is stored in a place protected from weather and free from acid fumes.

Use care when uncoiling or unreeling, so that the rope will not loop and form a kink.

•2•

Before a new rope is installed, make a thorough check-up of the equipment on which it is to work, to make sure

— that sheave grooves are of correct size and design.

— that sheave grooves are free from corrugations.

— that drum, sheaves and idlers are in line and properly lubricated so they will rotate freely.

— that there is no excessive fleet angle.

Unless you give your wire rope a fair chance, it will not give you the full service of which it is actually capable. In order to help all wire rope users obtain maximum efficiency from their wire rope, we publish a booklet "Practical Information on the Use and Care of Wire Rope," which covers many other conditions that deserve consideration. We would be glad to send a complimentary copy to any one interested.

A. LESCHEN & SONS ROPE CO.

WIRE ROPE MAKERS — ESTABLISHED 1857

5909 KENNERLY AVENUE — ST. LOUIS, MISSOURI, U. S. A.

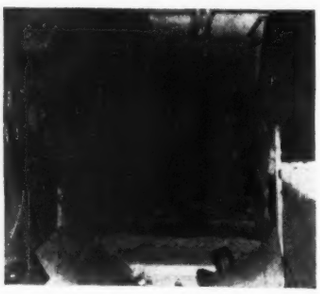
NEW YORK . . . 90 West Street
CHICAGO . . 810 W. Washington Blvd.
DENVER . . . 1554 Wazee Street

SAN FRANCISCO . . 520 Fourth Street
PORTLAND . . 914 N. W. 14th Avenue
SEATTLE . . 3410 First Avenue South

Why tipple designers are specifying SIMPLICITY gyrating coal screens

The days when 3 carpenters and a coal man would build a complete tipple are long past. Tipple designing today requires years of training and experience. In short, good tipple designers have to know their stuff. Thus we feel that the best testimony we can give about Simplicity gyrating coal screens is the fact that the country's leading designers are specifying them.

These engineers know that because of their rubber cushioned mountings, Simplicity screens offer freedom from frame vibration. They know that because of their roller bearings and counter-balanced shaft they insure faster screening speed. They know that because of their sturdy construction their maintenance and depreciation costs are low.



A Simplicity 4'x 8' single deck screen handling mine run coal and screening at the rate of 2100 pounds in 20 seconds in the tipple of a Michigan coal mine.

A 3'x 6' Simplicity single deck gyrating coal screen on a portable truck in a retail coal yard.

Whether you consult an outside engineer or your own, you will find that Simplicity units will help you to maintain your production at the lowest cost per ton. Write today for our free catalog on Simplicity gyrating coal screens.

Simplicity

ENGINEERING COMPANY · DURAND MICH.

foreman gives little attention to maintaining coal quality, much can be done at the face in the fields of blasting, control of loading from wet places, prevention of loading of large quantity of slate, dirty cuttings or tramp iron, etc., each of which can easily cause a shipment of coal to be off-grade. Proper shooting will raise the yield of coarse coal, cut powder cost, and insure greater uniformity in the size consist of the coal delivered to the washery, which in turn insures a high degree of uniformity in the ash content of the finished product. Loading wet coal results in a condition equivalent to an abnormal number of fines, blinding sizing screens and building up the load in the circulating water.

Keep Clean Coal from Refuse

"The efficiency of the washing plant is determined by the quantity of clean coal in the refuse, of coal wasted in an effort to obtain the best results." Therefore, constant testing and analysis are required to maintain plant efficiency and still obtain the best results possible. And with the increasing installation of laboratories by customers interested in the cheapest steam cost, the operator also finds it necessary to operate a laboratory in connection with his cleaning plant and thus safeguard his bids with proved knowledge of his product.

"The percentage of sizes is more or less determined by the preparation at the face, which in turn depends upon the demand of the market. Therefore, one must have a flexible preparation plant in order to meet these requirements." Emphasis is being placed upon the smaller sizes, this, no doubt, because of "the increased use of stokers. In sizing coals, the best and most modern equipment is necessary to insure a uniform product, and the special attention of the preparation manager is required. He must be educated to know the various sizes and the great importance of producing a coal that meets every demand of the consumer. A complete understanding between the sales department and the production management is necessary to minimize complaints. . . . Among other items of value to the preparation manager is a requisition made out by the sales manager for each week's anticipated car loadings. We have found this to be more desirable than receiving the car loadings day by day. . . .

Better Work Is Being Done

"The rapid growth of mechanical cleaning in the last five to ten years attests to the ingenuity of the engineers in the improvement of old equipment and the development of new. Good engineering judgment applied to the construction of a cleaning plant will eliminate the necessity for making adjustments on off-grade cars of coal. In the final analysis, one might safely say that, in view of the performance of recent installation and the wide variety of mechanical cleaning units to choose from, maintenance of preparation efficiency is fundamentally a problem of coordinating men, management and machines to produce a commodity which is marketable on a competitive basis."

Mechanical cleaning is now a necessity, declared H. G. Conrad, general manager, Knox Consolidated Coal Corporation, Bicknell, Ind. Float-and-sink results are a surer guide to selection of equipment and plant

FREE—

Mining and Contracting Hand Book

You'll use this practical wire rope book often. 96 pages of facts, tables, illustrations — for superintendents, engineers, purchasing agents. Send for your free copy *today!*

Flame, heat, power—how easily the average man takes them for granted. With no more thought than he gives the match he throws away, he accepts the services and benefits made possible by coal. Yet these would be non-existent if the vast coal industry had not probed the earth, mined and distributed the fuel, overcoming obstacles all the way.

The punishment inflicted on wire rope by shaft and strip mining practice never lets up. But old-time operators agree that Preformed Yellow Strand has the deep-bred endurance to meet the challenge. Its special steel wire combines *strength* to handle tremendous loads on hoists, shovels and draglines . . . *elasticity* to withstand quick starts and stops . . . *toughness* to take shocks on cutting and loading machines, to fight abrasion above or below ground.

Preforming heightens the value in Yellow Strand Wire Rope. A limber, non-kinking cable reeves quickly, spools evenly on the drum, resists bending fatigue on small sheaves. Men handle it faster and without risking injury from wickered wires.

All these qualities add up to long life, low *final* cost. Equip new operations and replace worn mine cable with Preformed Yellow Strand. The cost-per-ton records will verify your choice.

BRODERICK & BASCOM ROPE CO., ST. LOUIS. *Branches:* New York, Chicago, Houston, Portland, Seattle • *Factories:* St. Louis, Seattle, Peoria

YELLOW STRAND
Preformed WIRE ROPE

A Mainstay of the Mining Industry

The SuperDuty Diagonal-Deck Coal Washing Table is so closely linked with new methods and new performance records in coal preparation, that many engineers credit it with creating a new horizon—if not symbolizing in itself the new horizon.

Again . . . The One and Only Coal Washing Table Exhibited at the Coal Show

Unprecedented ever increasing field acceptance is proof of that extra capacity and greater washing efficiency available in the modern design and construction of SuperDuty tables and reflected in dollar-making performance per sq. ft. of floor space occupied.

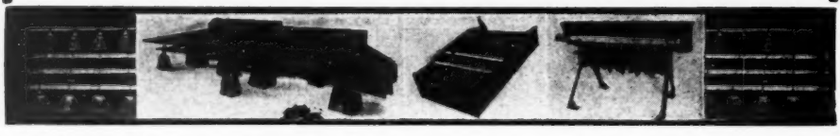
In the last twelve months the outstanding new washer projects of national and international importance requiring washing tables, have selected—almost without exception—SuperDuty Diagonal-Deck equipment.

THE DEISTER CONCENTRATOR COMPANY

COVERACO PRODUCTS — The Original Deister Company, Est. 1906 — COVERACO PRODUCTS

909 Glasgow Ave. — Fort Wayne, Ind.

Spray Nozzles • Duplex Washing Tables • Leahy Screens • Constriction Plate Classifiers



Takes a Lot of Punishment

It is most important that the mine telephone line keep in service constantly—yet it is so often neglected. Therefore every installation should be of long-life, hard duty, genuine

Ironite **MINE TELEPHONE WIRE**

A wire so good—so tough—that it gives long satisfactory service under most difficult conditions.

- **Highly corrosion resisting**
- **Heavily insulated—30% para rubber**
- **Tough weather-proof braid**
- **Saturated with waterproof stearine pitch**
- **Armored with impregnated mica flakes**

Yet, with all these superior features, IRONITE is priced to save you from 20% to 30% over copper or bronze.

Write your specifications for quantity quotations.

PARAGON ELECTRIC CO., 405 S. Dearborn, CHICAGO

operation than ash figures. Working on a float-and-sink basis guarantees maximum efficiency, whereas attempting to clean to an ash figure lower than warranted results in an undue waste of good coal. Washability tests are a vital prerequisite in the design of a cleaning plant. In this connection Mr. Conrad cited a statement by the late Col. Edward O'Toole to the effect that the best dollars which can be spent are those spent in making the preliminary investigation.

"Sinews of Steel," a movie on the manufacture of wire rope by the Bethlehem Steel Co., was the concluding feature of the technical sessions.

•

Personal Notes

IRA CLEMENS, for more than 35 years a conspicuous figure in the Kansas coal industry, has retired from active duty with the Commercial Fuel Co., Pittsburg, Kan., but retains his interest in the industry and the company. He was one of the original directors of the company and was vice president for a number of years before becoming president. He also was for a long time head of the Interstate Coal Operators' Association and was active in the Fuel Administration during the World War.

Ira Clemens

L. E. COMPTON has been named president and general manager of the Commercial Fuel Co., Pittsburg, Kan., vice Ira Clemens, retired.

S. R. CORTIS has been promoted from superintendent of Montour No. 10 mine of the Pittsburgh Coal Co. to assistant to Assistant Production Manager J. T. Bartram.

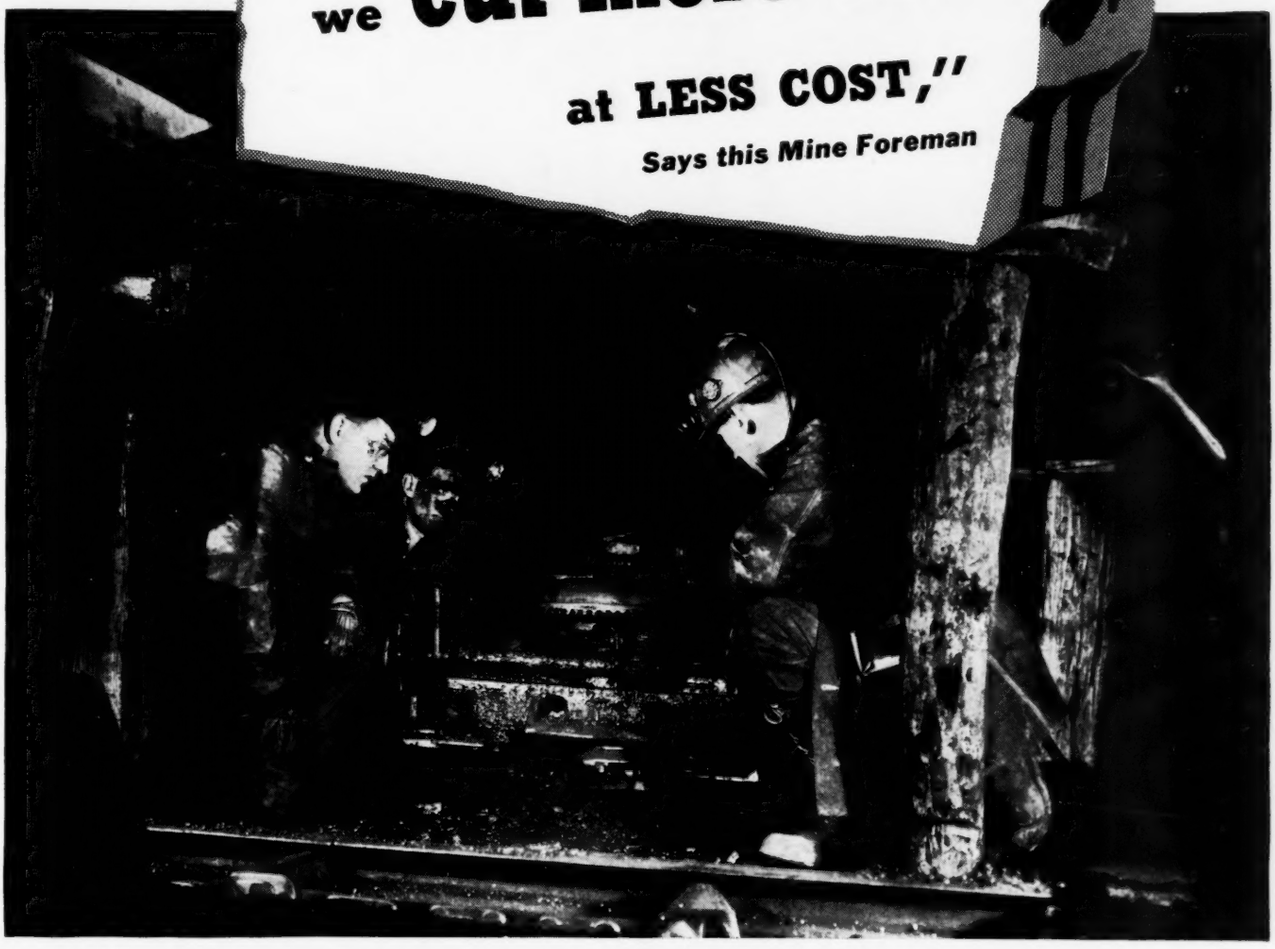
T. G. FERGUSON, formerly superintendent at Westland mine of the Pittsburgh Coal Co. and later superintendent at Vesta No. 4 mine of the Vesta Coal Co., has been appointed superintendent at Montour No. 10 mine of the Pittsburgh Coal Co.

ABE FORTAS, who has been general counsel of the Bituminous Coal Division, Department of the Interior, has been named

An actual photo of a Gulf engineer *(left)* discussing cutting-machine lubrication with Mine Foreman *(right)*.

"With GULF QUALITY LUBRICANTS we cut more coal at LESS COST,"

Says this Mine Foreman



"The Gulf Engineer's Recommendations help us get continuous production and avoid repair bills."

"WE keep production up and costs down at the seam by keeping our cutting machines on the job all the time—thanks in large part to the quality lubricants recommended by the Gulf engineer," says this Mine Foreman. "Gulf Periodic Consultation Service is of actual dollar and cents value to us."

Are you looking for a means of getting full capacity performance every day in the year from your equipment? Ask a Gulf engineer to give you his suggestions for its proper lubrication. You can benefit from his thorough training and broad experience with all types of mining equipment.

The Gulf line of more than 400 quality oils and greases is quickly available to you through more than 1200 warehouses in 30 states from Maine to New Mexico. Write or phone your nearest Gulf office today.

GULF INDUSTRIAL LUBRICATION

GULF OIL CORPORATION . . . GULF REFINING COMPANY . . . GULF BUILDING . . . PITTSBURGH, PA.

IT WILL *PAY YOU* TO GET DETAILS ON THIS NEW, "LOW VEIN" CAR SPOTTING HOIST!

Write for the complete story on this new, 20" high Car Spotting Hoist. Its construction and design are right in line with your thin seam mining operations. Performance . . . economy . . . all-around efficiency, regardless of local conditions . . . these are the qualities that can best be translated into lower cost mining . . . *and this hoist has them all!* A letter to us today will receive our immediate attention . . . will bring information as to prices, sizes, specifications, etc. *Write!*

DIMENSIONS:—78" long—32½" wide—20" high. Weight—2025 lbs.
ROPE CAPACITY—500 ft. ⅝"—750 ft. ½".
ROPE DRUM:—8" diameter, 14¾" wide, flanges 19" diameter.
POWER:—Any standard make and type of motor can be supplied.
CONTROL:—Can be operated from any point by enclosed safety switch or time starter.

FLOOD CITY BRASS & ELECTRIC COMPANY
JOHNSTOWN • • • PENNSYLVANIA

JONES & LAUGHLIN STEEL CORPORATION
AMERICAN IRON AND STEEL WORKS • PITTSBURGH, PENNSYLVANIA

acting director of the department's new Division of Power.

J. D. HARLAN has been named vice president and general manager of mines of the United States Smelting, Refining & Mining Co., with offices in Salt Lake City, Utah. He succeeds the late Edward A. Hamilton. A graduate of the Missouri School of Mines, Mr. Harlan joined the company in 1922 and was active in mining and mine examination work in Colorado and New Mexico. In 1937 he became vice president and general manager of the United States Fuel Co., a subsidiary. Last December he was made vice president and consulting engineer of the smelting company with headquarters in Boston.

F. A. HUFF, heretofore superintendent of Fidelity No. 11 and Red Ray No. 13 mines of United Electric Coal Cos., Illinois, has been transferred to the company's land acquisition department.

CARL LEE, electrical engineer, Peabody Coal Co., operating in Illinois and Indiana, has been promoted to chief engineer.

ARNOLD LEVY, hitherto assistant general counsel of the Bituminous Coal Division, Department of the Interior, has been designated as acting general counsel.

ERIC LORELL, of Canton, Ill., has been appointed superintendent of Fidelity No. 11 and Red Ray No. 13 mines of United Electric Coal Co., in Illinois, vice F. A. Huff, transferred.

GEORGE C. MCFADDEN, assistant vice president in charge of operation of the Peabody Coal Co., with operations in Illinois and Indiana, has resigned.

CARTER H. SCHUPP, recently general sales manager of the Elkhorn Coal Co., is now connected with the Chicago office of the Delaware, Lackawanna & Western Coal Co. as sales representative. The company contemplates extending its bituminous activities.

J. W. STARKS has been transferred from the southern Illinois division of the Peabody Coal Co. to division superintendent of the company's Taylorville and Springfield districts.

C. W. THOMPSON, formerly general superintendent, Kelleys Creek Collieries Co., Ward, W. Va., has been appointed superintendent of Bergoo No. 2 mine, Pardee & Curtin Lumber Co., Bergoo, Webster County, W. Va., in place of A. Fred Phelps, who died recently.

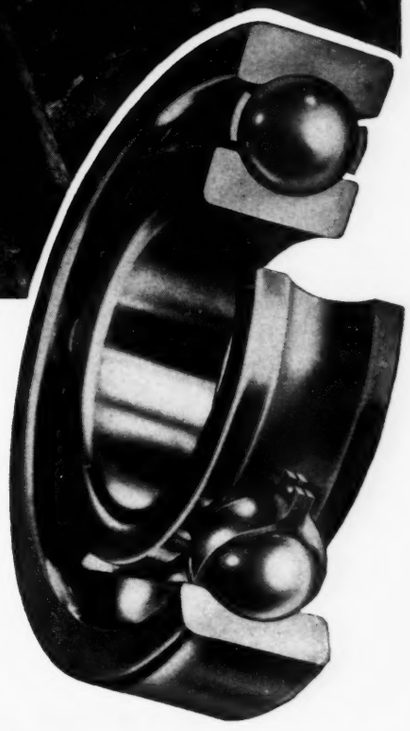
•

Maryland Offers Fellowships

The University of Maryland, in cooperation with the U. S. Bureau of Mines, offers two fellowships for research in the field of engineering and applied science. Fellows enter upon their duties July 1 and continue for twelve months, including one month for vacation. Payments under a fellowship are made at the end of each month and amount to $600 a year. The university will remit payment of tuition fees and will grant all fellowship privileges.

Fellows register as students in the gradu-

On this Explorer Diamond Drill, built by Ingersoll-Rand Co., SKF Angular Contact Bearings take the thrust of the feed nut assembly, and SKF Deep-Groove Ball Bearings, protected against dirt by labyrinth enclosures, take combined radial and thrust loads on back, motor and journal shaft assemblies.



Dependable Drilling

ON SKF BALL BEARINGS

There's no danger of bearing trouble with this Explorer Diamond Drill as it searches for new veins in the dim depths of a mine. That's because the bearings that take the loads . . . the bearings that keep rotating parts functioning freely . . . are SKF's. The simple statement "SKF-equipped" is sufficient to explain the good performance of any machine anywhere.

SKF INDUSTRIES, INC., FRONT ST. & ERIE AVE., PHILA., PA.

4782

BALL SKF BEARINGS

ANOTHER STOKER DAMAGED

by

TRAMP IRON

And another customer lost! Stokers cannot digest tramp iron and the inevitable result is a black eye for the coal distributor. No need to go into details, BUT

The growing stoker coal market demands magnetic protection — powerful, electrically energized magnets either in the form of magnetic pulleys, as shown (Bulletin 301) automatic spout magnets (Bulletin 97-A) suspended magnets (Bulletin 25-B) or others. ELIMINATE TRAMP IRON with

Stearns MAGNETIC

equipment. In satisfactory and profitable use by outstanding producers and distributors. When you write give us details on capacity, plant layout, etc.

STEARNS MAGNETIC MANUFACTURING CO.

661 S. 28th St., Milwaukee, Wis.

ate school of the University of Maryland and may expect to become candidates for the degree of Doctor of Philosophy. Class work will be directed by the heads of the departments of instruction, but about half the time will be spent in research work under direction of the Bureau of Mines staff at the Eastern Experiment Station, in College Park.

One followship will be assigned to a research project in the non-metals division and another to a research project in the coal division. The recipients will enroll in the department of chemical engineering and will be under supervision of the chairman of that department. The fellowship assigned to the coal division will be given preferably to a candidate who has majored in chemical engineering.

Fellowships are open to postgraduates of universities and technical colleges who have the proper training in engineering or applied physical science and who are qualified to undertake research work. Preference will be given to men who have already had one year of graduate work and who have experience in research work.

•

Republic Starts Rehabilitation Of Virginia Mine and Ovens

One hundred and fifty of the 303 beehive ovens at Virginia mine, built in 1902 and operated for about 20 years, have been rehabilitated and repaired by the Republic Steel Corporation for operations which were started last month. The mine is in southwestern Jefferson County, Alabama, about 7 miles from Bessemer and 35 miles from Birmingham.

Virginia mine comprises 1,125 acres and is on the America seam. Included in the property is a village named Virginia City containing about 100 dwellings, situated on a spur of the Louisville & Nashville R. R. The mine will be rehabilitated for modern methods of operation. The tipple will be rebuilt of steel and a 15-ton skip hoist will be used to haul the coal up the 2,600-ft. main slope to a dump tipple where there will be a Bradford breaker to remove rock. Mechanical loading will be used entirely, with output at the rate of about 400,000 tons annually.

The mine was opened originally on May 1, 1902, by Aldridge and DeBardeleben, who sank the slope 75 ft. and began operations, when the property was sold to the Schuler brothers. In 1907 the property was purchased by the Southern Iron & Steel Co., which later became the Gulf States Steel Co. Virginia mine remained the property of the latter company until its merger with the Republic Steel Corporation in 1937.

•

Federal Mine Bill Becomes Law: Ohio Inspection Ordered

The federal mine inspection bill, H. R. 2082, was signed May 7 by President Roosevelt. The measure provides that annual inspections may be made by the U. S. Bureau of Mines, or more frequently if the Bureau desires (*Coal Age*, April, 1941, p. 105). Government inspectors will cooperate with State boards in promoting installation of safety devices in the mines.

The disputed clause governing the qualifications of inspectors now provides "that in the selection of persons for appointment as coal-mine inspectors no person shall be so selected unless he has the basic qualification

Holmes Certificate Awarded for Accident Reduction

J. J. Forbes (left), supervising engineer, safety division, U. S. Bureau of Mines, presents Joseph A. Holmes Safety Association's certificate of honor to J. B. Morrow (right), president, Pittsburgh Coal Co., while Patrick J. Fagan (center), president, District 5, United Mine Workers, looks on. The award was in recognition of the Pittsburgh Coal Co.'s record in reducing accidents from one per 13,281 tons of coal mined in 1936 to one per 54,827 tons last year and 87,542 last December.

IF YOU DIDN'T SEE IT

at Cincinnati

Write for details on the new CP Self-Propelled Truck-Mounted Coal Drill Unit that has drilled as many as 170 holes (4-inch diameter, 9 feet deep) in a trackless mine in one 7 hour shift.

This mobile unit is equipped with two drill arms, hydraulically operated and of proper length to take care of the height of seam and width of room. Available for storage battery or cable reel operation, with tractor tread or pneumatic rubber tires for trackless mines or flanged wheels for track operation.

ALSO ON EXHIBITION WAS THE WELL-KNOWN LINE OF

CP

Post-Mounted Electric Coal Drills
Hand-Held Electric Coal Drills
Electric and Pneumatic Drills
Nut Runners, Grinders, Chipping Hammers, Riveting Hammers, etc., for maintenance and repair.

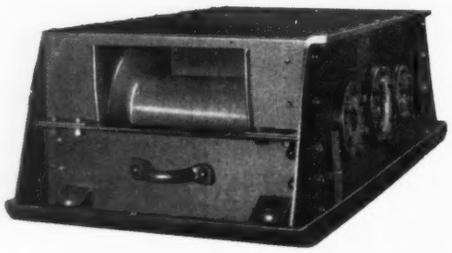
CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 6 EAST 44th STREET, NEW YORK, N. Y.

SALES OFFICES AND SERVICE STATIONS THROUGHOUT THE WORLD

THE BROWNIE

MODEL HKM CAR SPOTTING HOIST

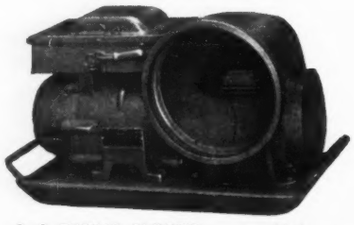


A NEW UNIT
For Efficient, Economical Car Handling in Low Seam Conveyor Mining

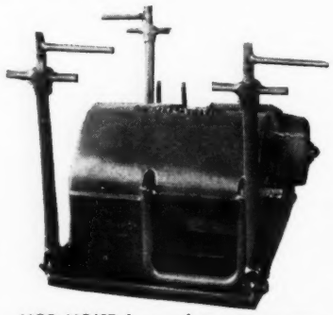
• This latest model of the famous "BROWNIE" line of car spotting hoists sets a "new low" in size and a "new low" in car spotting costs. It is only 20" high, with sled type base and built-in posting seats for easy handling in thin seams. Remote control and automatic mechanical brake provide simple, accurate spotting of cars and quick changing of trips. All working parts are completely enclosed and anti-friction bearings are used throughout.

Investigate its possibilities. Check into the savings it can bring you through more rapid, more efficient spotting of cars in low coal. A letter to us will bring complete details—write!

And Also For Underground Service



B C TUBING BLOWER—a new high capacity unit for auxiliary ventilation.



HGD HOIST for moving conveyor supplies and equipment.

MINE CARS AND WHEELS · HOISTS PUMPS · BLOWERS SHEAVES
OIL SPRAY SYSTEMS · RETARDERS RERAILERS

THE BROWN-FAYRO COMPANY
940 ASH ST. JOHNSTOWN, PA.

of at least five years' practical experience in the mining of coal, and is recognized by the U. S. Bureau of Mines as having the training or experience of a practical mining engineer in those essentials necessary for competent coal-mine inspection." The measure was sponsored by J. Harold Flannery (D.), of Pennsylvania.

Secretary Ickes took his first action under the new law on May 15, directing the Bureau of Mines to send engineers to Ohio, where, he said, a representative of the United Mine Workers had requested immediate inspections. Mr. Ickes said that Thomas J. Price, vice president of District 6, U.M.W., wired that mines in Ohio were being operated in an unsafe manner and that State inspections were unsatisfactory.

Marcus Kerr, chief of the Ohio Division of Mines and Mining, said he would welcome a federal inspection of mines because "Ohio mine conditions are undoubtedly better than the national average."

•

14 Die in Indiana Mine Blast

An explosion on May 22 in the Panhandle mine of the Bicknell Coal Co., near Bicknell, Ind., took a toll of 14 lives. The victims were caught 325 ft. underground about a half mile from the shaft; 17 other miners working on the same level but about 2,500 ft. away escaped. All of the bodies have been recovered. An investigation into the cause of the blast was started the following day. A similar explosion two weeks previous killed two miners.

•

Fifty-Year-Old Mine Closes

Hillsboro Coal Co., Hillsboro, Ill., has abandoned its mine after 50 years of activity. Unable to operate at a profit, the buildings are being dismantled and the machinery is being sold. For many years this mine was managed by the late Rice Miller, veteran coal operator, who held numerous responsible positions in the industry.

•

Drops Williamstown Holdings

Susquehanna Collieries Co. has, by lease and sale, disposed of all its former holdings in the Williamstown colliery, in Dauphin County, Pennsylvania, to the Williamstown Collieries Co., effective May 1. The latter is a newly organized concern headed by H. R. Randall and incorporated April 22 with a capital of $175,000. The purchase by the new corporation included all mine property with the exception of the power plant.

•

Reorganize Interstate Coal Co.

Interstate Coal Co., under receivership for a number of years, is to be reorganized. Its mine at Sesser, Ill., is to be rehabilitated. As the engine and boiler rooms were destroyed by fire some years ago, the entire set-up will have to undergo extensive repair

Learn a lesson from a ship story about Fiberglas* Electrical Insulation

LISTEN TO THIS: a brand-new 800 K.W. generator was recently installed in an overworked English liner. Its coils were wound with Class A insulation. The slot insulation was Class B.

And what happened?

The insulation failed on its first trip . . . leaving the ship's pumps, fans, blowers, and other electrical equipment without current.

So, the generator was rewound by Electrical Engineers, Inc. This up-to-the-minute organization uses Fiberglas insulation *exclusively* for Class B requirements. They used Fiberglas on the generator, and since then . . .

. . . the ship has been in grueling, continuous service, with *no failure* of its main power plant.

Moral: If you have a tough job for electrical insulation — use Fiberglas. Experience in scores of U. S. industries proves that proper application of Fiberglas enables *other* types of equipment to stand up where they previously failed in service with other insulations.

And, Mister, that saves money!

How About Fiberglas For Normal Service?

Suppose your generators, motors, or other electrical equipment have been working under entirely normal conditions. No overloads. No excessively high temperatures . . . no acids, oils, dusts, or dampness. Can Fiberglas help *you?*

You bet it can! Take motors—

Chances are . . . your motors will be working more and *more* hours now that all industry is moving ahead on faster schedules. Therefore, downtime on your equipment due to motor failure is an increasing danger.

You can obtain the maximum safety factor, as other companies have, by insulating your standard-size motors with Fiberglas!

There's another way Fiberglas may help you, for today top-ranking motor manufacturers also make Fiberglas-insulated motors that are smaller than present Class A insulated motors of the same H.P.

Yet these Fiberglas-insulated units operate safely at approved higher temperatures, and . . . *still have a substantially higher safety factor!* Cost? A little more in some instances—no more in others.

Wouldn't it be wise, then, for you to protect yourself against downtime losses, by protecting your equipment with Fiberglas? Do that. Specify Fiberglas Electrical Insulation. *Owens-Corning Fiberglas Corporation, Toledo, O. In Canada: Fiberglas Canada, Ltd., Oshawa, Ont.*

OWENS-CORNING

FIBERGLAS*

*T. M. Reg. U. S. Pat. Off.

SPECIFY FIBERGLAS ELECTRICAL INSULATION

For **CRAMPED QUARTERS**

•

DE LAVAL WORM GEARS

De Laval worm gear driving Jeffrey belt conveyor at mine of Brule Smokeless Coal Company.

are self-contained. They can be built with the worm either above or below the worm wheel, while the worm wheel shaft can be extended either to right or to left, or upon both sides. The right-angle drive permits of placing the motor alongside the driven machine and offers great flexibility in the arrangement of machines. Improved mechanical equipment is still better if driven by De Laval Worm Gears.

Ask for Bulletin W-1111 on "Worm Gear Drives"

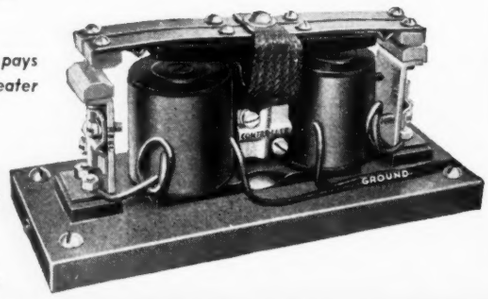
DE LAVAL WORM GEAR DIVISION
of the De Laval Steam Turbine Co., Trenton, N. J.

P-G Automatic Transfer Switch

. . . PROTECTS YOUR EQUIPMENT AND PROMOTES SAFETY!

Motorman is protected—no hand switches to operate, entirely automatic, eliminating shocks and burns. Simple, safe and efficient, easy to install, can be mounted anywhere. Ohmstone base not affected by moisture or creepage.

Here is a small investment that pays big dividends in good-will, greater safety and increased production



AVAILABLE FOR SINGLE and DOUBLE *Trolley Locomotives* 250 and 500 Volts

THE POST-GLOVER ELECTRIC CO.
• ESTABLISHED 1892 •
221 WEST THIRD STREET, CINCINNATI, OHIO

or be replaced. Five per cent preferred stock is to be issued to offset creditors' claims, while a government loan of $175,000 has been arranged to put the mine in working condition. Wages, compensation and union dues are to be considered preferred claims.

•

Want Closed Collieries' Waters Drained From Mines

Presentation of a certificate of honor to L. D. Lamont, division superintendent, on behalf of W. J. Richards, former president, Philadelphia & Reading Coal & Iron Co., in recognition of the latter's 50-year membership in the institute, an address on national defense by Representative John G. Scrugham, of Nevada, a member of the House Committee on Appropriations, and two short addresses on the water problem in anthracite mines signalized the meeting of the Anthracite Division, American Institute of Mining and Metallurgical Engineers, at Pottsville, Pa., April 25, at which W. H. Lesser, electrical and mechanical engineer, Pierce Management, presided. Representative Scrugham was introduced by Edward Steidle, dean, Mineral Industries Division, Pennsylvania State College.

Successful men, declared S. H. Ash, district engineer, U. S. Bureau of Mines, Wilkes-Barre, Pa., don't wait for things to happen; they make them happen. That, said he, is something to be borne in mind in regard to the water problem arising out of abandoned mines. The present worth of the coal originally present in Pennsylvania would be sixty-five billion dollars.

Referring to the water pumped from anthracite mines, Richard Maize, Secretary of Mines, State of Pennsylvania, said 620 millions of gallons was pumped every 24 hours —a heavy load on an industry burdened with many problems. The cost of pumping this water is $13,880 per day. A project to spend $179,000 in a general survey of the problem was under consideration. W. Garfield Thomas, Deputy Secretary of Mines, State of Pennsylvania, also spoke, and a film was shown portraying with sound effects the first all-anthracite first-aid meeting held at Kingston, Pa., Sept. 28, 1940.

•

Frederic M. Sackett Is Dead

Frederic Moseley Sackett, 72, chairman of the board of the Black Star Coal Co., operating in Harlan County, Kentucky, and the Pioneer Coal Co., in Bell County; former United States Senator from Kentucky and Ambassador to Germany during the Hoover administration, died of heart attack May 18 in the Lord Baltimore Hotel, Baltimore, Md.

Born in Providence, R. I., and educated for the bar, he went to Columbus, Ohio, shortly after his graduation from Harvard Law School and practiced his profession in the Ohio capital for four years. He then practiced in Cincinnati for one year, when he took up his residence in Louisville in 1898. Two years later he became interested in the coal industry, abandoning the law in 1907 to give his entire time to business. In 1913 he became president of the Black Star

Frederic M. Sackett

Coal Co. and vice president of the North Jellico and Beaver Dam coal companies.

He was Federal Food Administrator for Kentucky, 1917-1919; was elected Senator in 1924, resigning in 1929 to go to Germany as Ambassador. He relinquished the latter post in 1933, resuming his business interests in Louisville. He was elevated to the post of chairman of the board of the Black Star and Pioneer coal companies in 1939.

•

W. D. Georg Passes

W. D. Georg, superintendent for the Perfection Coal Co., Duquoin, Ill., while inspecting the property on May 5, accidentally fell into deep water and was drowned. Previous to his employment by the Perfection company he was superintendent for the Halliday interests at Hallidaysboro, Ill.

•

Additions at Superior Mines

Work was started late in April on the construction of three new buildings for the Union Pacific Coal Co. at its Superior (Wyo.) mines. The new structures, which will be of modern durable construction to replace old ones, will include a material warehouse, general repair shop and mine office. The mine office, 47x31 ft., will include an emergency first-aid room and an adjoining ambulance garage.

•

W.V.U. Short Course Ready

The 29th annual short course in coal mining sponsored by the West Virginia University School of Mines and the Vocational Division of the State Department of Education will be held this year from June 16 to July 26. The course, which lasts six weeks, will be held at the university, Morgantown; Beckley Junior High School, and Logan High School.

The subjects listed for study include: mining arithmetic, mine ventilation, mine gases, mine fires and explosions, drainage and pumping, timbering, methods of mining, safety lamps, electricity, haulage, explosives,

COALMASTER

STAGGERED TOOTH TOOLS

for Post and Machine Mounted Drills

Drill Straight Holes without CHOKING

You don't have to fight the equipment to get the work done

Driller gets time to relax while the drill works

No excessive vibration

Holes are started and drilled quickly and easily

Tools run smoothly

Made in sizes to drill correct holes for all powder, CARDOX, AIRDOX, HYDRAULIC, and SPECIAL requirements, COALMASTER TOOLS give you many drilling advantages. The breaking action works faster and eliminates coring. Your drillers are able to keep the drilling up to schedule more easily and get the necessary time therefore to do a better job. Smoother holes, straighter holes and freedom from bit breakage are the result. You save on power—wear on augers is minimized—drilling time per hole is materially cut.

We are drilling specialists and are ready to help you with your Drilling PROBLEMS

We have met all kinds of problems under varying conditions. Hundreds of tests are behind us. All this experience, and equipment designed with a knowledge of your requirements, are yours for the asking. Our engineers have made many recommendations to date that have simplified former drilling problems and helped producers get much lower drilling costs. Send the coupon today—get all the facts on modern COALMASTER TOOLS—see how, because of our complete line, you can be equipped to drill a hole of any necessary size.

USE THE COUPON

COALMASTER tool designs are all based upon a staggered (patented) bit positioning plan evolved from extensive research and development carried on in many seams and in many states.

CENTRAL MINE EQUIPMENT CO. 641
4520 Enright Ave.
St. Louis, Mo.

Send us your folder on COALMASTER Tools for Blast Hole Drilling.

Name.....

Title.....

Company.....

Location.....

TRIED AND PROVED BY ACTUAL TEST TO STAND UP BEST UNDER MOST SEVERE CONDITIONS

POSITIVE ASSURANCE Against - - - -

Flame — ABC cloth has the benefit of much research and actual test in order to secure the best known flame resistant chemical treatment.

Fungi — The chemicals used in our treatment form a compound which will resist the many types of fungi found in some mines.

Leakage — Our high specifications mean a closely woven cloth from heavy Jute yarns, assuring you of working places well ventilated.

Shrinkage — Moisture found in many mines will not cause shrinkage of ABC Jute; therefore you are "playing safe" when using ABC Jute because no air can escape underneath the curtains.

We have served every coal mining field for years, and ABC material is well known and recognized for quality by all our customers.

American BRATTICE CLOTH CORPORATION
WARSAW, INDIANA
Agencies in all Mining Centers

foremanship, drawing, and West Virginia mining law. Objectives of the course are to provide training that will help ambitious and capable mining men to obtain certificates of competence as mine foremen and firebosses and to promote safe and efficient mining practice through the provision of competent supervisory personnel.

Further information can be had by addressing D. L. McElroy, director, School of Mines, West Virginia University, Morgantown, W. Va.

•

Operators' Group Presents Plan to Reduce Pittsburgh Air Pollution

Making smoke abatement a cooperative job will avoid much hardship, reconcile conflicting interests and enlist the active support of all groups, according to a report by the smoke committee of the Western Pennsylvania Coal Operators' Association presented at an open hearing May 13 of the Pittsburgh Smoke Commission. George Love, president, Union Collieries Co., chairman of the committee, introduced Horace F. Baker, former president and one of the trustees of the Pittsburgh Terminal Coal Corporation, who outlined the committee's plan.

Conceding that "anthracite is a smokeless fuel," Mr. Baker declared that its cost in the Pittsburgh area, partly because of heavy freight charges, makes its use in place of high-volatile coal prohibitive. Gas and oil he also designated as luxury fuels, for which reason he considered it would be unreasonable to make their use obligatory for low-income consumers.

Low-Volatile Coal for Houses

Semi-bituminous coal, he said, could be used in domestic hand-fired furnaces if certain changes in grate bars, stacks and dampers were made, and temperature control introduced—"and the smoke resulting would be decreased but not eliminated." Coke also can be burned efficiently in domestic stoves and furnaces, though mechanical adjustments would be necessary in many cases. Advantages in the use of coke for domestic heating pointed out were: cost, elimination of smoke, ease and cleanliness in handling. The quantity obtainable is limited at this time, however, said Mr. Baker, because of national defense needs. Limitation of supply also is a controlling factor in the use of processed coal.

Not only is tonnage listed as "domestic" smoky, however, but much so-called commercial tonnage produces appreciable smoke—such as hotels, office buildings, apartment houses, etc. This is due in many instances, said Mr. Baker, to faulty or obsolete equipment, or to lack of attention to the smoke phase of combustion.

Where industry has tried to eliminate smoke in its combustion operations, it was pointed out, it has achieved this objective through improvement of combustion methods and equipment rather than through changes to more expensive fuels. Therefore, the committee urged, the buying of better domestic coal-burning equipment should be encouraged, and it should be seen to that the equipment is properly sized and installed. Principles are being developed for better combustion of bituminous coal which probably can be applied to stoves, furnaces and boilers. Great strides are being made in stoker design, said the report, as well as in the preparation of coal at the mines, with the quality and fitness of many kinds of bituminous being improved to fit specific requirements.

In the light of the factors involved, the smoke committee recommended scheduling the program in three steps, as follows:

"1. Initial Stage.

"(a) Passage of a new ordinance to provide for a progressively applied and enforced smoke elimination program. This ordinance should restrict the emission of smoke within limits to be defined by the commission technical advisory committee and within regulations to be applied by a smoke bureau; it should also embody other basic principles which would be subsequently translated into regulatory action by the Smoke Bureau. Under this ordinance, compulsory action would not apply to domestic buildings with one or two dwelling units, or less than ten or twelve rooms, during this initial stage of the program; and in any event the ordinance should not preclude, as has been done in St. Louis, for example, the use of high-volatile coal in subsequently developed equipment which permits it to be burned smokelessly.

"(b) Organization of a Smoke Bureau, technically qualified and protected by Civil Service, with sufficient personnel to assure complete coverage. The provision for Civil Service is vital to insure permanency of the program.

"(c) Creation of an Appeal Board to consider appeals from the rulings of the Smoke Bureau.

"(d) Adoption of a schedule of fees for inspections and penalties for violation—the sum total of which might be expected, as has proved true in the case of Chicago, to make the Smoke Bureau self-supporting.

Authority of Smoke Bureau

"(e) Authority to the Smoke Bureau to issue regulations, make stack inspections and smoke determinations, and, subject to modifications or reversal by the appellate board, to condemn installations, refuse or void previously issued permits, order improvement in combustion practices, and cite violators for corrective penalties.

"(f) Establishment by the Smoke Bureau or by the ordinance itself of a deferment period in order to give sufficient time to certain groups to arrange for compliance in the most efficient and economical manner.

"2. Intermediate or Development Stage.

"(a) As part of the development stage in this program, we recommend that the very exhaustive survey recently completed by the W.P.A. on the subject of dust deposition from smoke fly ash and metallic

oxide . . . should be digested for possible guidance in our effort to obtain air cleanliness. To this end, the Coal Operators' Association repeats its offer to pay half of the costs, up to a maximum expenditure of $3,000 by the operators, of an analysis and condensation of the survey findings.

"(b) Based on the above and other studies, some decision should be reached during this intermediate stage on how and when to regulate sources of air pollution other than smoke.

"(c) A Smoke Bureau must be considered as more than a punitive agency. It should contain the talent for stimulating voluntary cooperation, and for organizing smoke control councils in heavy industry, in the transportation fields, among the utilities, among commercial and light industrial consumers of fuel and, perhaps, even among segments of the domestic consumers. Appeals to civic pride and the use of competitive performance ratings would do much to give impetus to the movement.

"(d) Intensive collaboration between the Smoke Bureau and commercial or research organizations in the development and introduction of improved stoves, furnaces, stokers, and other combustion equipment—with the aim of regulating, as soon as practicable, smoke in all domestic as well as commercial fuel consumption.

"(e) Collaboration with other municipalities to make the program countrywide, and to exchange experience and help.

"(f) Refinement of inspection, permit and enforcement practices.

"*3. Final Stage.*

"(a) Organization of the data and results of experience derived from stages 1 and 2.

"(b) Shaping of the ordinance into final form and its enactment and application.

"(c) Establishment of provisions to insure continuing application and improvement as technological developments warrant.

"(d) Advertising and publicity to acquaint people in other communities with what will have been accomplished in Pittsburgh."

•

New Preparation Facilities

BERWIND-WHITE COAL MINING CO., Air Cleaning Plant, St. Michael, Pa.: Contract closed with Roberts & Schaefer Co. for addition consisting of three Stump Air-Flow cleaning units to handle 0x$\frac{3}{4}$-in. coal; capacity, 100 t.p.h.; to be completed Aug. 1.

CLIFFORD BRESSLER, Pine Grove, Pa.: Contract closed with Deister Concentrator Co. for three SuperDuty Diagonal-Deck No. 7 coal-washing tables, one for No. 1 buckwheat, one for rice and one for barley anthracite coal.

CARTER COAL CO., Olga No. 2 mine, Juno, W. Va.: Contract closed with Kanawha Mfg. Co. for Kanawha-Belknap washing equipment for egg (75 t.p.h.), stove (125 t.p.h.) and nut coal (75 t.p.h.)

DAWSON COAL CO., Clarksburg, W. Va.: Contract closed with Roberts & Schaefer

THIS girl is held upside down in space from a Dings *High Intensity* Magnetic Pulley by the powerful lines of magnetic force pulling on thin strips of iron on her ski boots!
This striking illustration shows you why Dings can advertise "The Most Powerful Magnetic Pulley on the Market Size for Size!"—and only Dings has made this demonstration.
Dings Pulleys are more powerful than others because they have *bronze* spacers instead of steel. Steel short-circuits lines of force. And Dings Pulleys are *air-cooled* because heat generated by the coil diminishes magnetic power. They have more surface for radiating heat than any other pulley. Remember these things when you buy a pulley for removing tramp iron from stoker coal. After all, when you buy a separator, you are buying *magnetic pulling power.* Be sure you get the maximum. Write to Dings.

PULLEYS — SPOUT MAGNETS — SUSPENSION MAGNETS—Dings builds a complete line of high intensity electromagnetic separators for every type of installation. Sizes, capacities and other data available without obligation. Write today outlining your problem.

DINGS MAGNETIC SEPARATOR COMPANY
535 Smith Street, Milwaukee, Wis.
Separation Headquarters Since 1899

Dings
MAGNETIC SEPARATION
HIGH INTENSITY

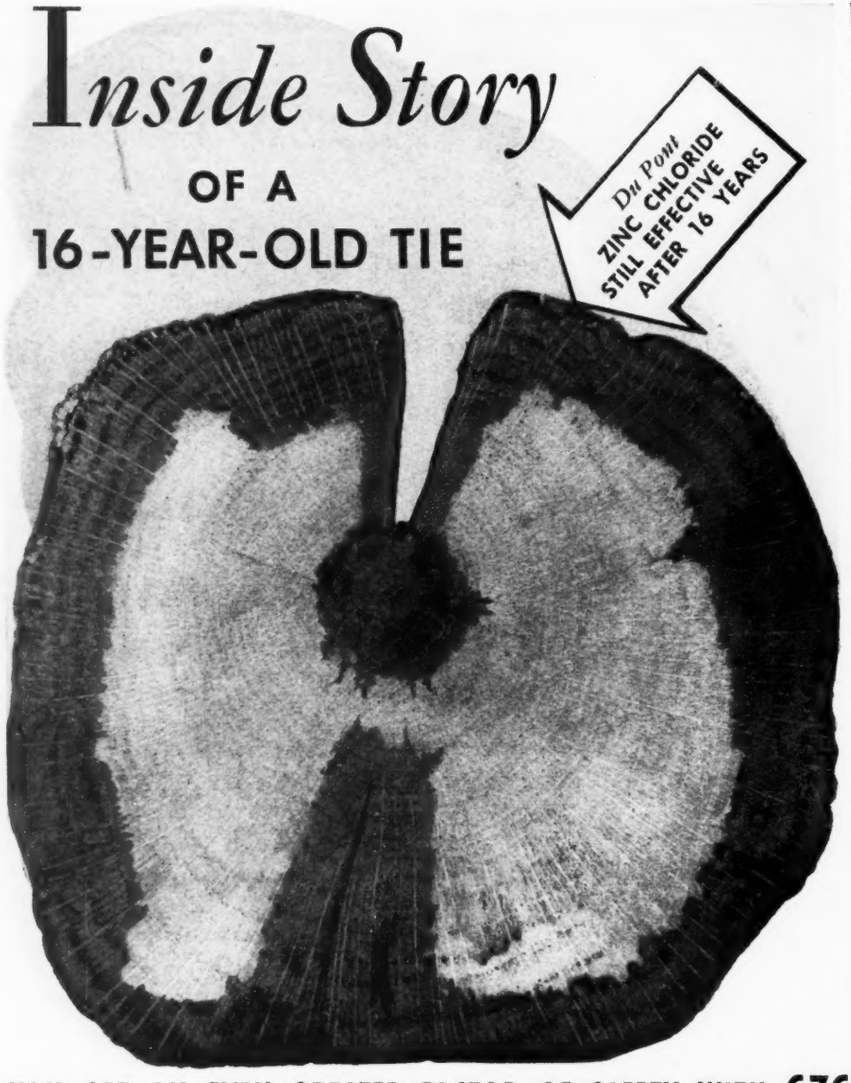
4 Out of 5 Read and Study at Home!

4 out of 5 subscribers receive their monthly COAL AGE at their home address. Coal mining, by its very nature, does not permit "Office" reading, except by office personnel. Duties and lighting conditions in the mine, or preparation plant, obviously limit work-time reading.

Why not let us send your new or renewal subscription to your home where you will be able to give it your full attention?

COAL AGE — A McGRAW-HILL PUBLICATION
330 W. 42nd St., New York, N.Y.

Inside Story
OF A 16-YEAR-OLD TIE



YOU GET AN EVEN GREATER FACTOR OF SAFETY WITH CZC

THIS center section of a cross tie demonstrates the excellent wood preservative value of Du Pont zinc chloride. This tie was in constant service from 1923 to 1940 and was in good useable condition when removed for inspection. The above photo proves that zinc chloride, shown by dark area in tie, not only penetrates to the heartwood, but it stays in the wood with practically no leaching, even in extremely wet conditions!

The improved Du Pont CZC (chromated zinc chloride) brings you even greater savings through wood preservation. Here's how the CZC factor of safety can save you money: the life of timber treated with Du Pont CZC is multiplied *from 3 to 10 times!*

Timber treated with Du Pont CZC is also fire retardant, clean and odorless, giving added fire protection, permitting safety in handling and avoiding confusing odors foreign to mines. You'll find CZC treated timber a wise investment for cribbing, lagging, shaft timbers, air course timbers, haulage way ties, and fire stops. Our informative booklet, "Wood Preservation for Mines," will be sent on request. E. I. du Pont de Nemours & Co., (Inc.), Grasselli Chemicals Department, Wilmington, Delaware.

SPECIFY LUMBER TREATED WITH

DU PONT REG. U. S. PAT. OFF. **CZC**

CHROMATED ZINC CHLORIDE

Co. for additional facilities to crush lump coal to ¾-in. size; capacity, 150 t.p.h.; to be completed July 1.

EBENSBURG COAL CO., Colver, Pa.: Contract closed with Fairmont Machinery Co. for Chance sand flotation cleaning process for 2x⅜-in. coal; capacity, 235 tons per hour; to be completed Oct. 1.

CHARLES H. ECKERT, Jonestown, Pa.: Contract closed with Deister Concentrator Co. for one SuperDuty Diagonal-Deck No. 7 coal-washing table for barley coal.

ALBERT HOKE, Millersburg, Pa.: Contract closed with Deister Machine Co. for one Deister Plat-O coal-washing table to clean No. 4 buckwheat from a river operation; capacity, 15 tons per hour.

HUDSON COAL CO., Marvine Colliery, Scranton, Pa.: Contract closed with Wilmot Engineering Co. for Anthra-fine and Anthra-filt coal-cleaning plant; equipment will consist of vibration screen for removing silt from breaker water, 8-in. Wilmot Hydrotator to clean Anthra-fine, high-speed Wilmot screen for dewatering and other screens for sizing Anthra-filt; capacity, 80 tons per hour; to be completed about Aug. 10.

HUNTER COAL CO., Antrim, Pa.: Contract closed with Roberts & Schaefer Co. for complete facilities to clean 0x¾-in. coal, consisting of two Stump Air-Flow cleaning units; capacity, 100 t.p.h.; to be completed Aug. 1.

JONATHAN COAL MINING CO., Kulp Plant, Paxinos, Pa.: Contract closed with Deister Concentrator Co. for one SuperDuty Diagonal-Deck No. 7 coal-washing table to handle barley coal.

KOHINOR COAL CO., Kohinoor Colliery, Girardville, Pa.: Contract closed with Wilmot Engineering Co. for coal cleaning plant to prepare stove to No. 4 buckwheat sizes of anthracite; equipment will consist of Chance cone to treat stove to No. 1 buckwheat sizes, two 5-ft. and one 6-ft. Wilmot Hydrotators to clean rice, barley and No. 4 buckwheat; Wilmot rolls, screens and other equipment; capacity, 150 t.p.h. of feed; to be completed in 16 weeks.

LILLYBROOK COAL CO., Mine No. 3, Lillybrook, W. Va.: Contract closed with Kanawha Mfg. Co. to revamp washing equipment, install Menzies Hydroseparator, dewatering screen and conveying equipment; capacity, 50 t.p.h. of 1¼x⅜-in. coal.

LOCUST COAL CO., Weston Colliery, Shenandoah, Pa.: Contract closed with Deister Concentrator Co. for one SuperDuty Diagonal-Deck No. 7 coal-washing table to treat No. 4 buckwheat anthracite.

NORFOLK & CHESAPEAKE COAL CO., Wilson Mine, Logan, W. Va.: Contract closed with Kanawha Mfg. Co. for headhouse equipment with rotary dump and feeder, hillside rope and button conveyor 800 ft. long in all-steel gallery; capacity, 250 t.p.h. of mine-run coal.

SEMET SOLVAY CO., Harewood, W. Va.: Contract closed with Kanawha Mfg. Co. for alterations to existing layout of river load-

ing structure and equipment; capacity, 450 t.p.h. of 0x4-in. coal.

SENTRY COAL MINING CO., Madisonville, Ky.: Contract closed with McNally-Pittsburg Mfg. Corporation for McNally-Vissac dryers to treat 200 t.p.h. of ¾-in. x ½-mm. coal with screening arrangement to remove the $\frac{3}{16}$-in.x½-mm. from the dried product; to be completed about Sept. 1.

UNION COLLIERIES CO., Mine No. 3, Renton, Pa.: Contract closed with Centrifugal & Mechanical Industries, Inc., for one 48-in. C.M.I. continuous centrifugal dryer to handle 50 t.p.h. of 0x$\frac{3}{8}$-in. coal.

Under reports on new preparation facilities in the May issue, p. 96, several installations of Kanawha-Belknap coal washers were erroneously listed as having been installed under contract with the Fuel Process Co. The contracts were with the Kanawha Mfg. Co.

•

New Hearing on Coal Costs Opened By Coal Division

Basis for reexploration of costs of producing bituminous coal was laid May 21 as the government sought to determine whether bituminous minimum prices should be revised. About 100 coal producers, distributors and consumer representatives assembled in Washington for the opening of a hearing to establish the average cost per ton to produce soft coal. George Lamb, economist for the Bituminous Coal Division, the only witness the first day, outlined methods used by the division in collecting basic cost data.

Paul Sifton, acting director of the office of Consumers' Counsel, said May 10 that many increases in bituminous coal prices being quoted to coal consumers "are not required by production costs as adjusted to include recent wage increases." He stated that during the preceding week consumers had reported that prices quoted on bituminous coal "were from 15 to 35c. a ton above the minimum prices fixed under the coal act." His statement was issued after consultation with the Office of Price Ad-

Permissible Plates Issued

Four approvals of permissible equipment were issued by the U. S. Bureau of Mines in April, as follows:

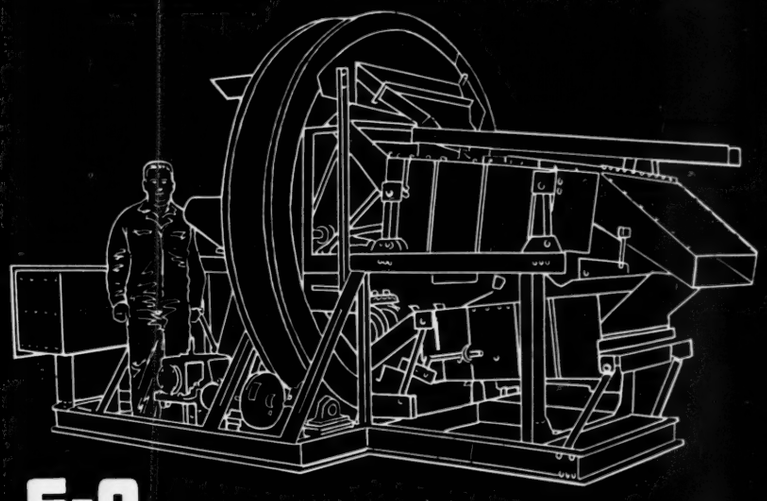
Ohio Brass Co.—Type GM distribution box, four branch circuits; 250 and 500 volts, d.c.; approvals 424 and 424A; April 14.

Goodman Mfg. Co.—Type 612-CK3 shortwall mining machine; 35-hp. motor, 440 volts, a.c.; Approval 425A; April 24.

Goodman Mfg. Co.—Type 91-C-15 chain conveyor; 15-hp. motor, 230 volts, d.c.; Approval 426; April 28.

Goodman Mfg. Co.—Type 91-C-12 chain conveyor; 10-hp. motor, 230 volts, d.c.; Approval 427; April 29.

Now... You Can Also DRY CLEAN FINE Coal (3/8"x0)



S-A fine coal cleaner

Similar in principle to the S-A Air Sand Coal Cleaner for cleaning larger sizes of coal . . . is the S-A FINE COAL CLEANER which dry cleans ⅜-inch by 0 coal.

Requires only one 15 H.P. motor. Shipped completely erected. *Write us about your coal handling and coal cleaning problems.*

Stephens-Adamson
—Mfg. Co.—
2 RIDGEWAY • AURORA, ILL.
Los Angeles, Cal. Belleville, Ont.

COAL CONVEYORS and DRY CLEANERS

STEPHENS-ADAMSON ENGINEERS SA MANUFACTURERS

NO WORD is heard more today than *preparation* . . . and no system prepares anthracite more efficiently than

Wilmot *Hydrotators* to meet today's modern demands for *clean* coal. That is why *Hydrotators* are being specified as the preparation process in so many new breakers and as replacement units in so many old breakers. "If it's *hydrotated*, it's cleaner coal." Wilmot Engineering Company, Hazleton, Pa.

WILMOT
A GREAT NAME IN THE COAL INDUSTRY
HYDROTATOR
COAL *Preparation* UNITS

GEMCO TRU-BLU TOOLS BETTER'N EXTRA HANDS —TO MAKE SUPER-MEN OF ALL YOUR MINERS!

RAIL LEVELERS FOR HOGGED RAIL— ALL SIZES FROM 8-80 POUND TRACK.

"GEMLOY STEEL" CONTEST WINNERS:
1. NOAH THOMAS, ISABELLA, PA.
2. W. C. FANCOURT, JOHNSTOWN, PA.
3. ROBT. ATCHISON, WESTLAND, PA.
4. HERB. HESSLIN, NORTH BEND, OHIO
5. CARL DONIE, LINTON, INDIANA

(Six other winners—List sent on request)

To other entries—Thanks for trying. If you didn't win we will be glad to send you any of our tools on a free trial basis.

You can cut your production cost by using all items in the "Gibraltar" line of mining tools: Standard and Ratchet type Rail Punches and Rail Benders; Spike Bars; Mine Cars for Track Layers, Drillers, Shot Firers, Supplies, Trouble Shooting, and "Hot Shot" Inspection Trips; Car Stops; Rerailers; Derailers; Mine Ambulances; Keyseating Machines; Grease Guns; Mine Car Wheels, (Pressed or Cast, Steel or Iron), Combination Track Tools, Car Movers, etc.

GIBRALTAR
EQUIPMENT & MFG. CO.
MADISON AT FOURTEENTH STREET,
ST. LOUIS, MISSOURI, U. S. A.

ministration and Civilian Supply, he said.

Preliminary figures showing the average cost of production issued April 19 by Secretary Ickes showed that average production cost had declined 18.65c. a ton since 1936-37, the base period used in setting the minimum prices which became effective last October. "This means that the effective minimum mine prices were on the average 18.65c. higher than they should have been," commented Mr. Sifton.

•

Coal-Mine Accident Fatality Rate Recedes Sharply

Accidents at coal mines of the United States caused the deaths of 83 bituminous and 15 anthracite miners in March last, according to reports furnished the U. S. Bureau of Mines by State mine inspectors. With a production of 48,250,000 net tons, the accident death rate among bituminous miners was 1.72 per million tons, compared with 4.09 in March, 1940.

The anthracite fatality rate in March last was 3.26, based on an output of 4,596,000 net tons, against 3.71 in the corresponding month a year previous.

For the two industries combined, the accident fatality rate in March last was 1.85, compared with 4.05 in the third month of last year.

Fatalities during March last, by causes and States, as well as comparable rates for the first three months of 1940 and 1941, are shown below:

Anthracite Operators Begin Buying Bootleg Output

Anthracite producers in Pennsylvania began operation of the voluntary plan to take the output of bootleg coal holes at their collieries on May 5 (*Coal Age*, March, 1941, p. 86). The plan also calls for hiring bootleg miners, but it will be some time before jobs will be created at legitimate operations by handling of coal from the free-lance producers, according to Robert Y. Williams, Pottsville consulting engineer. Mr. Williams headed a survey which reported 12,000 bootleggers were engaged in producing 5,000,000 tons of anthracite last year—all of which went to market in competition with the output of legitimate producers.

•

Methods and Results of Analyses Outlined by O. W. Rees

A lecture on the standard methods of coal analysis, covering the various determinations point by point, was delivered by Dr. O. W. Rees on May 15 at a meeting of the Illinois Society of Coal Preparation Engineers and Chemists, held at the Hotel Lymar, Herrin, Ill. Dr. Rees and Dr. F. H. Reed, associate and chief chemists, respectively, of the Illinois State Geological Survey, were guests of the evening.

For some determinations—ash, for example—Dr. Rees described more than one method, pointing out the inherent advantages or disadvantages of each. For the most part, the methods described are standard with or

UNITED STATES COAL-MINE FATALITIES IN MARCH, 1941, BY CAUSES AND STATES

	Underground										
State	Falls of Roof	Falls of Face	Haulage	Gas or Dust Explosions	Explosives	Electricity	Machinery	Total Underground	Open-cut	Surface	Grand Total
Alabama	..	..	2	..	..	..	..	2	..	..	2
Colorado	1	..	..	..	..	..	1	2	..	..	2
Illinois	6	1	1	..	..	..	..	8	1	..	9
Indiana	2	..	..	..	..	..	..	2	..	..	2
Iowa	2	..	..	..	..	..	..	2	..	..	2
Kentucky	6	..	2	..	..	2	..	10	..	..	10
Maryland	2	..	..	..	..	..	..	2	..	..	2
New Mexico	..	1	..	..	..	..	..	1	..	..	1
Ohio	3	..	..	..	..	..	..	3	..	..	3
Oklahoma	1	..	..	..	..	..	..	1	..	..	1
Penna. (bit.)	5	..	7	4	..	..	..	16	..	2	18
Tennessee	2	..	..	..	..	..	..	2	..	..	2
Utah	2	1	..	..	..	1	..	4	..	..	4
Virginia	2	..	..	..	..	..	..	2	..	1	3
West Virginia	14	1	4	..	..	..	1	20	..	1	21
Wyoming	..	..	1	..	..	..	..	1	..	..	1
Total bituminous	48	4	17	4	..	3	2	78	1	4	83
Penna. (anth.)	9	..	3	..	1	..	..	13	..	2	15
Grand total	57	4	20	4	1	3	2	91	1	6	98

DEATHS AND FATALITY RATES AT UNITED STATES MINES, BY CAUSES*

January–March, 1940 and 1941

	Bituminous				Anthracite				Total			
	Number Killed		Killed per Million Tons		Number Killed		Killed per Million Tons		Number Killed		Killed per Million Tons	
Cause	1940	1941	1940	1941	1940	1941	1940	1941	1940	1941	1940	1941
Underground:												
Falls of roof and coal	149	128	1.247	0.956	24	28	1.855	1.999	173	156	1.306	1.054
Haulage	57	48	.477	.358	15	8	1.159	.572	72	56	.544	.378
Gas or dust explosions:												
Local	5	5	.042	.037	1	2	.077	.143	6	7	.045	.047
Major	163	5	1.364	.037	...	...	.....	.....	163	5	1.231	.034
Explosives	8	8	.067	.060	2	3	.155	.214	10	11	.076	.074
Electricity	8	5	.067	.037	1	...	.077	.....	9	5	.068	.034
Machinery	9	9	.076	.067	...	...	.....	.....	9	9	.068	.061
Shaft	1	...	.008	.....	...	1	.....	.071	1	1	.007	.007
Miscellaneous	8	...	.067	.....	1	2	.077	.143	9	2	.068	.014
Stripping or open-cut	4	12	.033	.090	2	1	.155	.071	6	13	.045	.088
Surface	11	10	.092	.074	3	5	.231	.357	14	15	.106	.101
Grand total	423	230	3.540	1.716	49	50	3.786	3.570	472	280	3.564	1.892

* All figures subject to revision.

approved by the American Society for Testing Materials. The speaker explained that there is close cooperation between the organizations interested in coal analyses and that means are being sought to eliminate discrepancies between processes and between laboratories. Graphs and tables were used to visualize some of the difficulties encountered as well as to prove the accuracy of results attainable. Tolerances permitted by A.S.T.M. are not seriously exacting, said Dr. Rees.

His closing remarks and the discussion that followed were largely devoted to practical interpretation of the chemical and physical tests of the laboratory. Among these was a button test to determine the tendency of a coal to form coke trees in the domestic underfeed stoker. Results of Illinois Survey tests have been corroborated by Battelle Memorial Institute.

•

To Revise Chimney Code

Building codes for chimney construction are to be formulated and revised by the American Standards Association. The anthracite industry will be represented on the Committee of Ten, which will represent the entire solid fuel industry, by a member and an alternate appointed from the staff of Anthracite Industries Laboratory at Primos, Pa.

•

Anthracite Gas Producer Fired

Gasifying 1,800 to 1,900 lb. of anthracite an hour, the first producer in the new gas manufacturing plant at the Halcomb Steel works, division of the Crucible Steel Co. of America, Syracuse, N. Y., was placed in operation April 28. Representing a total expenditure of about $250,000, the complete unit will consist of six producers, which went under construction several months ago. Each producer will have a capacity of 20,000,000 B.t.u. an hour. The gas will be used in reheating semi-finished material in several departments of the Halcomb plant.

•

Industrial Notes

JOHN A. ROEBLING'S SONS CO., Trenton, N. J., has appointed Robert T. Bowman as director of public relations. He served three years as president of the New Jersey State Chamber of Commerce, retiring from that position late in April.

PANGBORN CORPORATION, Hagerstown, Md., announces removal of its Philadelphia office to 3701 North Broad St. Forrest G. Sharpe, formerly assistant to the sales manager, has been appointed Philadelphia sales engineer, succeeding William T. Randall, who died suddenly of a heart attack on April 14.

ROLLER-SMITH CO., Bethlehem, Pa., has appointed W. R. Swoish as vice president in charge of sales, and James E. Bevan as vice president in charge of manufacturing operations. Mr. Swoish, a graduate of Ohio State University, was with Westinghouse Electric & Mfg. Co., before joining Roller-Smith in 1939 as sales manager. Mr. Bevan, graduated from Lehigh University, became associated with Roller-Smith in 1928 after having been connected with the Bethlehem Steel Co. and the Philadelphia Electric Co.

ALLIS-CHALMERS MFG. CO., Milwaukee. Wis., announces that Lee H. Hill, newly elected vice president, will head a newly created industrial relations department. In his new capacity, Mr. Hill, formerly assistant manager of the electrical department, will be directly responsible for company rules and regulations, adaptation of jobs and men, job rating, merit rating, foremen's training programs, graduate engineers' training course, apprentice schools, all schools for specialized training such as inspectors and welders, suggestion system, welfare organization, safety and sanitation, company hospitals, working conditions, insurance and pension plans, plant commissaries, club house and recreational programs—all of which will be designed to create a closer relationship between the company's executive and shop personnel. W. C. Van Cleaf will continue his work in industrial relations, reporting to Mr. Hill.

MORRIS MACHINE WORKS, Baldwinsville, N. Y., has appointed H. J. Lynch as representative in the Detroit district with offices at 403 Kales Building.

AMERICAN ENGINEERING CO., Philadelphia, has appointed these representatives: George J. Sturmfelsz, 1208 Southview Road, Balti-

Place Heavy Roof Timbers Faster and Safer

with the No. 366 Simplex Timber Jack.

No more staggering under the load of heavy wood or steel beams. The No. 366 tightens against the roof and bottom and is quickly set up for double acting jacking into place. The timber bracket may be used in the line drawing position. Base revolves 360°. Built in 4 sizes. Ask your supply house.

Send for Bulletin Mines 40

Templeton, Kenly & Co.
Chicago

Better, Safer Mine Jacks Since 1899
California, Pa. Princeton, W. Va.

Simplex Jacks
dependable and efficient
Lever Type for toe and cap lifting.
Hydraulic for easier cap lifting.
Screw Jacks for economy.

Low Cost OSMOSE TREATED TIMBER

CONTINUES TO CUT DOWN THE HIGH COST OF REPLACEMENTS

for prominent companies throughout the mining fields of the entire United States.

Above—*The Hatfield Campbell Creek Coal Co. uses Osmose Treated Ties and Timbers in both Kentucky and West Virginia mines.*

•

Every week still more mining companies are taking advantage of Osmose Treated Timber above and below ground, in and around their mines. Many of these companies carefully checked the results of other users who have had years of experience with Osmose Treated Timber. These reports showed that the Osmose Wood Preserving Process is:

EFFECTIVE—Osmose Treated Timber lasts at least three to five times longer.

ECONOMICAL—Treatment costs only $10 to $12 per MBF.

CLEAN, odorless and fire retardant.

APPLICABLE to fresh cut native woods locally obtained without necessity for investment in treating plant.

•

THE OSMOSE PROCESS BRINGS THE SCIENCE OF WOOD PRESERVATION TO YOUR OWN BACK DOOR.

Write for details.

OSMOSE WOOD PRESERVING CO.
General Offices, Buffalo, N. Y.

Branch Offices

Birmingham, Ala. — Denver, Colo.
Harlan, Ky. — Mt. Vernon, Ill.

FOR
BETTER POWER CONTROL

MESCO SECTION SWITCHES

Mesco Section Switches are deigned to stand severe use, yet these switches are efficiently built for greater safety and service. Constructed of tough quality bronze, they are available in all types and sizes for use with any trolley wire and feeder cable. Knife edge approach assures smooth under-run. Switch blades, easily interchangeable from right to left hand, are swiveled on insulated hinge. Hinge is provided with dowel hole for inserting lock to hold switch open for line repairs.

Write for more complete information on how Mesco Section Switches protect you against power and profit leaks.

MOSEBACH
ELECTRIC & SUPPLY COMPANY
1115 Arlington Avenue Pittsburgh, Pa.

DIAMOND
CORE DRILLING
CONTRACTORS

Specializing in Testing Coal Properties.
We Guarantee Satisfactory and
"PROPER COAL CORES"

•

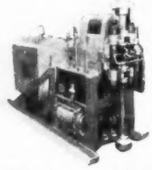
Inside Mine Drilling.

•

Pre-Grouting For Mine Shafts.
Solidification of Wet Mine Areas.

•

Wells and Discharge Holes
Drilled and Grouted.



1200' - 2¼" Core — Oil Hydraulic

Light Gasoline Drills Saves Fuel
and Moving Cost

MOTT
CORE DRILLING CO.
Huntington, W. Va.

more, for the State of Maryland; H. E. Mensch, 424 Book Building, for the Detroit (Mich.) territory.

General Electric Co., Schenectady, N. Y., has advanced E. D. Spicer, manager of the Schenectady works, to the post of assistant to the vice president in charge of manufacturing. J. M. Howell, hitherto executive assistant to Mr. Spicer, succeeds his chief.

R. G. LeTourneau, Inc., Peoria, Ill., has purchased the Avery Farm Machinery Co. plant, adjacent. The new quarters, totaling 282,000 sq.ft., will house the production lines for manufacture of the Tournapull and the power control units which supply power for all LeTourneau machines.

•

Hard-Coal Producers to Hold First-Aid Meet

Independent operators in the Eastern Middle, Western Middle and Southern anthracite fields of Pennsylvania will hold a first-aid meet Aug. 9 at Lakewood Park. The teams that are successful in this competition will go to Kingston to compete in the final anthracite meet to be held at a later date.

The following companies will participate at Lakewood: Haddock Mining Co., Frackville Coal Co., Primrose Coal Co., Indian Head Colliery Co., Buck Run Collieries Co., Williamstown Colliery Co., Pine Hill Coal Co., Locust Mountain Coal Co., Repplier Coal Co., St. Clair Coal Co., Morea-New Boston Breaker Corporation, Colonial Colliery Corporation, Hammond Coal Co., William Penn Colliery Co., Delano Anthracite Collieries Co., East Bear Ridge Colliery Co., Stevens Coal Co., Cranberry Improvement Co., and Coal Rain Coal Co.

•

Accident Prevention Signs To Be Standardized

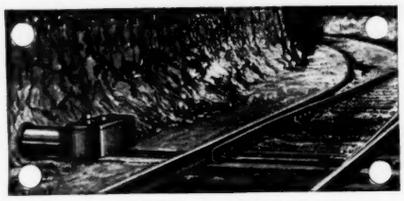
A new standard for industrial accident prevention signs which provides for uniform colors and wording is announced by the American Standards Association. The association believes that for maximum safety warning signs should be so designed that reaction to them will be automatic, particularly in work places where employees cannot read English readily but can be trained to recognize instantly and be warned by standard sign designs and colors.

With this thought in mind the committee developing the standard has divided all accident prevention signs into five major groups: (1) Danger signs to be used to warn about specific dangers only and removed as soon as the danger warned against no longer exists; (2) caution signs used to warn against possible danger or unsafe practices; (3) safety instruction signs providing information regarding general safe practices; (4) directional signs used to point the way to staircases, fire escapes, exits, etc.; (5) informational signs used to carry messages of a general nature such as rules and regulations.

The standard sets forth the best current practice in color, design, application and use of all accident signs classified in the above groups. The committee hopes that all

AUTOMATIC
SWITCHING

. . .The way to more tonnage

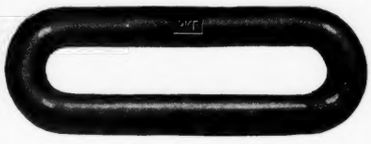


Eliminates stops for Switch Throwing.
Speeds haulage safely.
More trips means more tonnage.
Operates electrically at normal trip speed.
Reduces Labor Costs.
Reduces Power Costs.
Reduces Accidents.
Switch is thrown by motorman on locomotive.
Makes possible non-stop runs from face to tipple.
Can be used as a De-Rail.
Can be operated by Remote Control.

Send for bulletin.

AMERICAN MINE DOOR COMPANY
2057 Dueber Avenue, Canton, Ohio.

FOR SAFETY'S SAKE,
SUPERIOR COUPLINGS



Drop Forged Links

Drop forged for strength, Superior Swivel and Single Link Couplings are built to stand the gaff. No welds to let go with resulting wrecks. Superior Couplings on your mine cars will prevent accidents and reduce haulage costs. Order Superior Couplings for your replacements and specify them on new equipment.

DROP FORGED SWIVEL
COUPLINGS

PITTSBURGH
KNIFE & FORGE CO.
Park Building
PITTSBURGH, PENNSYLVANIA

new signs and replacements of old signs will be designed and constructed in accordance with these specifications. Thus, in time the accident prevention signs used by all industry will be the same and employees, no matter where they work, will recognize the same familiar designs and colors that have to them definite meanings. "American Standard Specifications for Industrial Accident Prevention Signs"—Z35.1, 1941—has been published in pamphlet form and is now available at 35c. from the American Standards Association, 29 West 39th St., New York City.

•

Dickson Coal Co. to Market Link-Belt Stokers

Arrangements have been perfected whereby the Dickson Coal Co. will distribute the complete line of Link-Belt stokers through various branch offices and dealers of the Dickson company, according to announcement by K. C. Ellsworth, Eastern sales manager, Link-Belt stoker division, and Thomas Dickson, president, Dickson Coal Co.

This association brings together two well-known old organizations. Link-Belt has been building coal-preparation, materials handling and power-transmission equipment since 1875, and is a pioneer in the development of the modern household automatic stoker for both bituminous and anthracite. Dickson Coal Co. is one of the best known anthracite producers, with headquarters in New York.

•

Children of Koppers Miners To Get Clinic Service

More than 3,000 children from the families of mine employees of the Koppers Coal Co. are expected to receive physical examinations at 18 free clinics which will be conducted this summer by the company's 26 doctors and 16 nurses, according to Thomas E. Lightfoot, director of welfare of the company. Children of pre-school age—six months to six years—will be given these free examinations if brought to the clinics by their parents.

Company clinics are held at the following locations: West Virginia—Maitland, Carswell, Kopperston, Powellton, Gallagher, Beards Fork, Kimberly, Smithers, Wharton, Keystone, Stotesbury, Helen, Glen White, Stanaford, Long Branch, Grant Town and Everettville; Pennsylvania—Melcroft and Sonman. Seventeen clinics were conducted by Koppers doctors and nurses in 1940, when 2,214 children were examined and 69 per cent of the physical defects discovered were corrected by medical care or surgical treatment.

•

Alabama Power Acquires Mine

Alabama Power Co.'s petition for permission to acquire the coal holdings and plant of the Southeastern Fuel Co. has been approved by the Alabama Public Service Commission. The fuel company was owned in part by the power company together with

• WHEAT •

PROPER INTENSITY
Correctly Distributed Light

Narrow beam for long distance visibility

Wide angle beam

for close work

Medium beam for intermediate work

WHEAT ALONE OFFERS:

Wheat Model **GM**—for mechanized mining operations where greater light is the first requirement for safety and production.

Wheat Model **GW**—for seams between four and six feet in thickness—favored by drillers, timbermen, tracklayers, hand loaders and mining engineers.

Wheat Model **GQ**—for low seams where the working height is limited—a small lamp producing a good steady light.

ANY TYPE BEAM FROM ANY WHEAT BATTERY

Q-50 oz. W-60 oz. M-72 oz.

Write for details

KOEHLER SAFETY LAMP

RUGGED • DEPENDABLE SENSITIVE

KOEHLER MFG. CO.
Marlboro • • • Mass.
Eastern Bituminous: WHEAT LAMP SALES, INC.
1501 Kanawha Valley Bldg., Charleston, W. Va.

TWINS OF MODERN MINING

WHEAT CAP LAMP

BETTER LIGHT - LESS WEIGHT NON-SPILLABLE

Coming Again this October . . .

Again this year COAL AGE has selected another major producing district for editorial review in our 21st Annual Model Mine Number . . . WATCH FOR ANNOUNCEMENT TO BE MADE SHORTLY!

COAL AGE — A McGRAW-HILL PUBLICATION
330 W. 42nd St. • New York, N. Y.

TIME TO PREPARE

for preparing

PREMIUM Stoker Coal

Erecting a "Pennsylvania" BRADMILL for preparing PREMIUM Stoker coal.

Tests made in 3 different types, leading to selection of equipment for preparing 1¼"x⅛" Domestic Stoker coal, indicated approx. 22%, and 16% minus ⅛" from two types, with varying amounts of oversize, while the BRADMILL test showed less than 9% ⅛" and *no* oversize.

With more than $1.00 differential between Stoker coal, and the ⅛" fines, savings show early amortization of the investment made in the BRADMILL.

On receipt of your Stoker Coal specifications, we will be glad to make recommendations and quotation on indicated equipment.

Ask for Bulletin 8001

PENNSYLVANIA CRUSHER COMPANY

Liberty Trust Bldg. Philadelphia

Representatives in principal centers

the Commonwealth & Southern Corporation. The Winona mine, located on the fuel company property, which is adjacent to the Alabama Power Co.'s large steam electric generating plant at Gorgas, was formerly a large producer, but has been closed about twelve years. The power company's second 40,000-kw. unit at Mobile, on which work has started, will use coal entirely.

•

Flames Destroy Clinton Tipple

A tipple at the Ayrshire-Patoka Coal Co.'s Clinton mine, near Clinton, Ind., was destroyed by fire May 2. The mine is a stripping operation. Two strings of cars under the tipple also were reported destroyed.

•

Koppers Acquires Idle Ovens

Koppers United Co., Pittsburgh, Pa., has bought two idle blast furnaces and two batteries of coke ovens from the Granite City Pig Iron Co., Granite City, Ill. The coke batteries, comprising 80 ovens, have been idle since 1935.

•

To Reopen Mine Idle 10 Years

Lehigh Valley Coal Co. has leased its Franklin colliery, in Wilkes-Barre Township, Pa., to Louis Pagnotti, independent anthracite operator. The property, which has been idle for ten years, at one time employed about 1,000 men. The Pagnotti operations now employ about 4,000.

Coal Geology Features Program Of Chicago Jubilee

Geological programs featuring the celebration of the 50th anniversary of the University of Chicago, Sept. 25 and 26, will be sponsored jointly by the Geological Society of America, Section E of the American Association for the Advancement of Science, and the University of Chicago. Papers will be presented by invitation, followed by open discussion. The coal program, comprising "Frontier Studies of the Physical Constitution of Coal and Their Practical Significance," to be presented the first day, will include the following papers:

"Modern Concepts of the Physical Constitution of Coal," Gilbert H. Cady, senior geologist, Illinois Geological Survey; "Influence of the Physical Constitution of Coal Upon Its Chemical Characteristics," H. H. Lowry, Carnegie Institute of Technology; "Practical Significance of the Physical Constitution of Coal in Coal Preparation," Louis C. McCabe, Quartermaster Corps, U. S. Army; "Influence of Physical Constitution of Coal Upon Its Chemical, Hydrogenation and Carbonization Properties," George G. Sprunk, U. S. Bureau of Mines, Pittsburgh, Pa.; "Physical Constitution of Coal as Related to Coal Description and Classification," Edward C. Dapples, Northwestern University.

•

P. & R. May Lease Coal Land

The Philadelphia & Reading Coal & Iron Co., now undergoing financial reorganization, petitioned the U. S. District Court at Philadelphia on April 30 for permission to lease 691 acres of coal land in Schuylkill County, Pennsylvania, to the Bell Colliery Co. The tract would be leased for mining operations on a royalty basis.

•

Trade Literature

BEARINGS—Ahlberg Bearing Co., Chicago. Answering the question, "What bearing number do I need?" Application Manual No. 3MM is devoted to a long list of mining machinery made by various manufacturers, together with the catalog numbers of Ahlberg bearings used in various parts of the machines.

CEMENTS—Smooth-On Mfg. Co., Jersey City, N. J. Handbook tells how to make practical low-cost and lasting repairs to equipment and pipe lines without dismantling or using heat. It contains diagrams and concise instructions on sealing cracks in castings, stopping leaks in apparatus, tightening loose fixtures and parts of equipment, making up tight pipe joints, patching concrete floors and walls, waterproofing cellars, cisterns, etc.

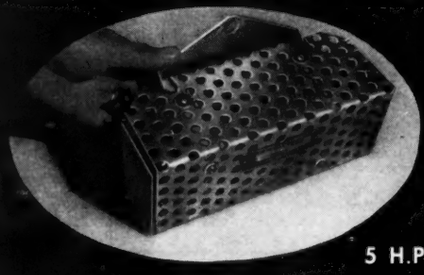
CENTRIFUGAL PUMPS—Allis-Chalmers Mfg. Co., Milwaukee, Wis. Bulletin B-6146 covers every pumping service requiring a single-stage double-suction centrifugal pump. In addition to construction features, pump dimensions, normal and special application data, the bulletin presents friction tables, head-capacity tables, and other valuable pump-engineering information.

COAL TREATMENT—Roberts & Schaefer

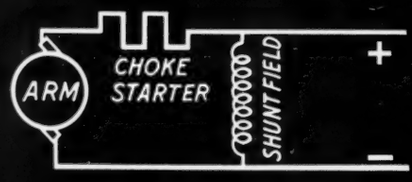
AUTOMATIC D. C. MOTOR STARTER

G.M.C. CHOKE STARTERS

* No Moving Parts
* Line Starting
* Stops Commutator Arcing
* Voltage Drop Across Resistance High at Start Low at Running Speed
* Low First Cost
* Low Maintenance Cost
* Ideal for Pump or Conveyor Motors



5 H.P.



Write for details

GUYAN MACHINERY CO.

LOGAN WEST VIRGINIA

Co., Chicago. Bulletin describes bituminous cleaning and classifying with the new Hydrotator. Leaflets point out advantages of the Tandem Hydro-separator and the Stump Air-Flow coal cleaner.

CONVEYOR IDLER—Link-Belt Co., Indianapolis. Folder 1793 describes a new trough-type rubber-tread impact idler designed to absorb the shock of receiving heavy, lumpy, rough materials at the loading point. Features claimed are: minimum breakage of fragile material such as coke, friable coal, etc.; cleans the belt and prevents building up of material; withstands corrosion and abrasion.

COUPLINGS—Falk Corporation, Milwaukee, Wis. Bulletin 8100 details and illustrates outstanding features of five types of Falk Airflex couplings. Included are typical installation views, complete discussion with example illustrations of the Airflex "rubber-loading-in-shear" principle, dimension drawings and tables on each type of coupling, and an easy-to-follow section on how to select Airflex couplings.

DISTRIBUTION BOX—Ohio Brass Co., Mansfield, Ohio. Bulletin 739M gives a complete description of the Type GM permissible multiple distribution box and covers its method of application; several illustrations provide visual analysis of the unit.

EARTH MOVERS—R. G. LeTourneau, Inc., Peoria, Ill. Folder A-18 graphically illustrates the use of Angledozers and Bulldozers from clearing to finishing. Designs and features are shown.

ELECTRICAL EQUIPMENT—General Electric Co., Schenectady, N. Y. Bulletin GEA-2456, entitled "More for Your Control Dollar," contains success stories of control for important motors. Bulletin GES-2677 tells how to start and protect a synchronous motor for best results. Bulletin GEA-3539 is devoted to various uses of G-E heating cable.

EXPLOSION-PROOF CABLE-REEL LOCOMOTIVE—Bulletin GEA-3234 details features and advantages of G-E "sealed-equipped" cable-reel gathering units offering safe haulage in gassy mines.

FLEXIBLE ALL-METAL HOSE—Pennsylvania Metallic Tubing Co., Philadelphia, Pa. Bulletin 55-F cites various uses of Penflex flexible all-metal hose.

HYDRAULIC EQUIPMENT—Blackhawk Mfg. Co., Milwaukee, Wis. Catalog 41-H and use manual describes how "harnessed" hydraulic power can be employed in maintenance, production and construction. "Porto-Power" maintenance equipment, pipe benders, hydraulic hand jacks, gage-equipped jacks, inverted jacks and wheeled floor jacks are covered.

INDUSTRIAL POWER UNITS AND MOTORIZED VALVES—Brown Instrument Co., Philadelphia, Pa. Catalog 77-1 describes a line of motor-power units and motorized valves designed to operate with Brown control instruments and form an important part of the control system. Dimension tables and schematic diagrams give an accurate idea of workmanship and operation.

LOADING MACHINES—Goodman Mfg. Co., Chicago. Bulletin L-403 reveals characteristics, operating advantages and construction features of the 360 and 460 track-type loaders—hydraulic or mechanical control.

MOTOR STARTER—Ohio Brass Co., Mansfield, Ohio. Booklet 733-M describes the line of Type ADG gas-proof automatic d.c. motor starters and their method of application. Illustrations showing the major units and open and closed views of the device, as well as a page full of mounting dimensions are included.

PICK BREAKER—McNally-Pittsburg Mfg. Corporation, Pittsburg, Kan. Bulletin 241-2 details performances and results of breaking lump coal in the McNally-Norton vertical pick breaker.

POWER CONTROLS—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Catalog 30,000 simplifies the selection of electrical equipment for any motor, lighting or feeder circuit. Subjects covered are safety switches, nofuze breakers, multi-breakers, panel boards, motor controls and motors.

TOOLS AND EQUIPMENT—Gibraltar Equipment & Mfg. Co., St. Louis, Mo. Bulletin lists and describes punches, cars, benders, straighteners, rerailers, keyseating machines, derailers and car stops, grease guns, spike and leverage bars, combination tools, and car movers.

TOOLS AND EQUIPMENT—Ideal Commutator Dresser Co., Sycamore, Ill. Catalog lists a variety of modern products designed to cut costs by straightening out operating snares.

VALVES, DRAINS AND BYPASSES—Jenkins Bros., New York. Booklet gives helpful information on the construction and selection of all types of valves as well as the proper application of drains and bypasses.

VARIABLE-SPEED DRIVES—Electric Machinery Co., Minneapolis, Minn. Bulletin presents principles, characteristics, advantages, and constructional forms of magnetic drives.

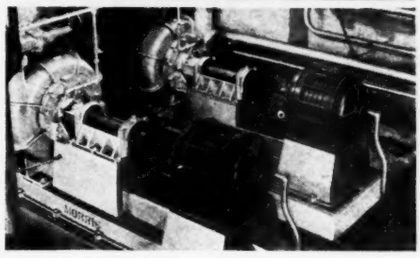
VIBRATING FEEDERS AND SCREENS—Jeffrey Mfg. Co., Columbus, Ohio. Bulletin 757 describes the principles of design and operation of Jeffrey-Taylor electric vibrating equipment for feeding, sizing, dedusting and dewatering operations in coal mines.

WATER SOFTENERS—Elgin Softener Corporation, Elgin, Ill. Bulletin 605 describes the company's line of double check zeolite softeners. Double check principle is explained and close-up views of nozzles and other design features show how loss of zeolite is prevented and how faster backwash flow rates are made possible.

WELDING AND CUTTING EQUIPMENT—Linde Air Products Co., New York. Booklet Form 4694 is designed to help the user or prospective user obtain a clear understanding of the oxyacetylene process and the various construction and operating features of welding and cutting apparatus used in applications of the process. It contains a guide to selection of the proper type of equipment, with a check list of important points to consider in selecting welding and cutting blowpipes, cutting machines, regulators, and acetylene generators. Booklet Form 4062B describes the many advantages of oxyacetylene cutting with portable machines, the

The MORRIS HYDRAULIC COLUMN

News of interest to Centrifugal Pump Users



Morris Slurry Pumps on Coal-Washing Service

Why buy Morris Pumps for coal mining services?

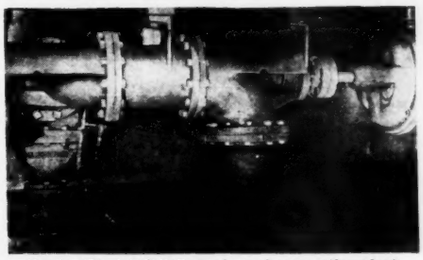
Because, firstly, Morris has specialized on building pumps for difficult services for 77 years.

Secondly, Morris makes the largest line of pumps for handling abrasives.

And thirdly, because of Morris performance records. They're remarkable and convincing.

So, always get a Morris quotation when you need centrifugal pumps for any coal mine service.

Write for bulletin on Morris Pumps in the Coal Industry



Morris "Straightflo" Pump in coal preparation plant

MEMBER

For authoritative recommendations on any pumping problem, write to Morris Machine Works, Baldwinsville, N. Y. Representatives in principal localities. *Export Office*, 50 Church St., New York.

PROFESSIONAL SERVICES

Consulting Engineering Examinations
Specialists Geologists Reports
Plant Design Operation Construction

ALLEN & GARCIA CO.
ENGINEERS AND BUILDERS OF MODERN COAL OPERATION
Authoritative Valuations and Reports of Mining Properties, Equipment and Operation.
332 S. Michigan Ave., Chicago
120 Wall Street, New York, N. Y.

C. C. MORFIT
Mining Engineer
Construction, Operation, Management
Valuation
11 Broadway, New York

EDWARD V. D'INVILLIERS ENGINEERING CO.
GEOLOGIST AND MINING ENGINEERS
Specialists in examination and valuation of bituminous coal properties; investigations of operating conditions, costs and markets; development of mineral resources.
Private records covering 40 years of professional activity in coal fields of United States and Canada.
121 N. Broad St., Philadelphia, Pa.

Stuart, James & Cooke, Inc.
ENGINEERS
Coal plant design, construction, supervision and operation. Operating cost surveys and analyses. Power surveys and electrifications. Examinations and valuation of coal properties.
17 Battery Place, New York

EAVENSON, ALFORD AND AUCHMUTY
MINING ENGINEERS
Coal Operation Consultants
Valuations
Koppers Bldg., Pittsburgh, Pa.

TEMPLETON-MATTHEWS CORPORATION
Designing Engineers—Consultants—Builders
Practical Application of Skilled Engineering to your Coal Preparation Problems."
1003 Sycamore Bldg. Terre Haute, Indiana

J. H. FLETCHER
Consulting Engineer
Mining Reports, Appraisals and Power Surveys
Engineering Management of Coal Mines
Automotive Gathering System
Mine Layouts
Telephone—Harrison 5151
McCormack Building Chicago, Ill.

PAUL WEIR CLAYTON G. BALL
Mining Engineers and Geologists
Examinations and Reports
Production, Preparation and Utilization
307 North Michigan Ave., Chicago, Ill.

T. W. GUY
Consulting Engineer
COAL PREPARATION
To Yield Maximum Net Returns
Face and Product Studies
Plant Design and Operation
Coal Sampling
Kanawha V. Bldg., Charleston, W. Va.

READERS MAY CONTACT
the consultants whose cards appear on this page with the confidence justified by the offering of these special services nationally.

diversity of operations which can be performed, and a variety of applications.

WETTING AGENT—Johnson-March Corporation, New York City. Bulletin is devoted to dust control in mines, tipples and at docks with Compound "M."

WIRE ROPE—American Steel & Wire Co., Cleveland, Ohio. Booklet entitled "Valuable Facts About the Use and Care of Wire Rope" gives facts and suggestions that are informative and helpful.

WIRE ROPE—Macwhyte Co. Kenosha, Wis. Folder contains helpful information on wire-rope inspection and illustrates common causes for its failure. Several wire-rope constructions are shown with recommendations for use.

WRENCHES—Blackhawk Mfg. Co., Milwaukee, Wis. Catalog 241 stresses developments giving special significance to the use of socket wrenches in speeding assembly, maintenance and service work.

LETTERS

To the Editor

Safety and First Aid

Much time and expense is used these days preparing men to do their work efficiently. Each man, on receiving employment, is given a book of rules to govern him in the discharge of his duties. He is supposed to keep these rules in mind at all times, which no doubt will go a long way in helping himself and his employer with a better safety record.

As considerable money is being spent by the employer to promote safety, I do not believe that first aid should be introduced to a workman while on duty. Every man should have a knowledge of first aid, but I do not believe it fits properly in the picture to stop him while he is performing other duties pertaining to his livelihood.

When a workman is stopped for a consultation on first aid or any other subject, he becomes impatient, for he is more interested in his regular work at that moment. When he resumes that job, he rushes to make up lost time in order to make the proper showing with his work. This rush frequently leads to an accident that spoils his own and his employer's safety record.

With an attractive safety club, every workman would be glad to spend a few minutes each week for the promotion of safety. There is plenty of useful information that could be given on safety by its members but is withheld because some member is ready to pounce upon the speaker and have him fined for a safety violation. If the safety club were attractive, it would be a very easy matter to sell the workman first aid instead of having to use compulsion or having to review an accident that happened because a workman was not interested while he was at his place of employment.

BENJAMIN LOHR.
Amberstdale, W. Va.